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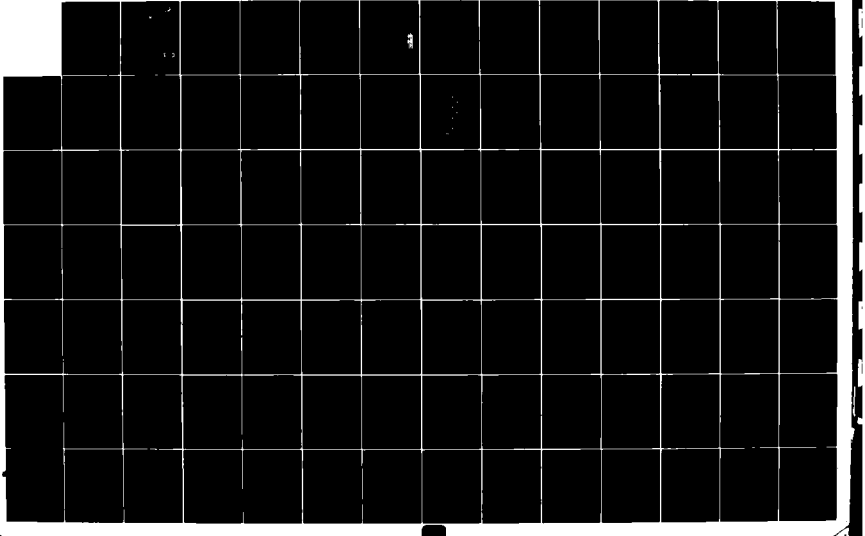

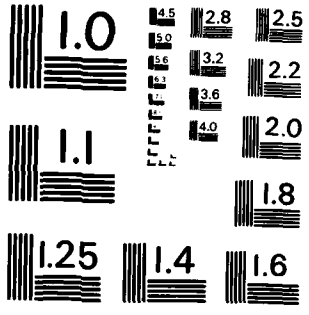

DEPARTMENT OF THE AIR FORCE
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AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

A CRITICAL SURVEY OF AIRCRAFT MAINTENANCE OFFICER TRAINING AND CAREER DEVELOPMENT

Timothy D. Bair, First Lieutenant, USAF
Clinton F. Gatewood, Captain, USAF

LSSR 57-82

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Skill imbalances created by sudden reductions in the rated supplement force and in the number of career broadening rated officers have prompted a serious decline in the experience level of the Air Force aircraft maintenance officer force. Since junior and relatively inexperienced officers must now assume positions and responsibilities normally reserved for more seasoned and experienced maintenance managers, training and career development programs must react to provide the instruction, hone the skills, and nurture the talent necessary to meet such challenges. This seminal work reviews civilian and military literature relating to career development and reports the results of a survey of the aircraft maintenance officer population. Through a policy model of the aircraft maintenance officer life-cycle, it explores problems and weaknesses in the career development process, recommends several specific solutions, and suggests areas for future research.

LSSR 57-82

A CRITICAL SURVEY OF AIRCRAFT MAINTENANCE OFFICER TRAINING AND CAREER DEVELOPMENT

A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirement for the

Degree of Master of Science in Logistics Management

By

Timothy D. Bair, BS
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September 1982

This thesis, written by

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and

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has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirement for the degree of

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COMMITTEE CHAIRMAN

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CHAPTER I

INTRODUCTION

Background

Our basic national security objective is to "assure the sovereignty and physical security of the United States [87:p. 1-1]." The national security policies supporting this objective are carried out through the instruments of national power, which are categorized as political, psychosocial, economic, scientific-technological, and military. The military instrument consists primarily of the uniformed Services of the Department of Defense (DOD).

Shortly following World War II, the composition of the military instrument changed when the National Security Act of 1947 established the United States Air Force (USAF) as a separate Service and defined its broad functions. In 1958, DOD Directive 5100.1, "Functions of the Department of Defense and Its Major Components," formalized the allocation of national security responsibilities among the three Services. Currently, Joint Chiefs of Staff (JCS) Publication 2, "Unified Action Armed Forces," expands DOD Directive 5100.1 and establishes joint force organization and employment policies. Throughout this evolutionary process of role definition, Air Force Manual (AFM) 1-1, "Functions and Basic Doctrine of the United States Air Force," has remained the single[1], authoritative document

[1]Until 1959, this publication was numbered AFM 1-2 and was entitled "USAF Basic Doctrine."

providing a focus on the Air Force mission, and translating national security policies into a cohesive philosophy and a statement of doctrine for basic, joint, and combined aerospace operations (87:p. vii).

The projection and use of aerospace power revolve primarily around our most flexible weapon system, the aircraft. To gain and hold air superiority during a conflict, we must maintain these weapons systems so they are at once capable, reliable, and properly configured to perform their assigned missions. AFM 1-1 highlights the logistics function as a key ingredient to insuring the time and place utility of aerospace forces:

> The management of logistics is central to the buildup, readiness, and operation of forces. The logistics manager not only determines what resources are needed by the operational and mission support forces, but is also responsible to procure, transport, store, allocate, and maintain these resources.
>
> Because this support determines the limits of our operational capability, it must be kept at the peak of readiness. Commanders at every level must control their resources by setting support requirements based on mission, transportation links, and the threat. They must also consider such logistics requirements as operational demand, system integrity, and readiness of support systems....Above all, [logistics support] must be as simple as possible and provide the right assets to the right place at the right time [87:pp. 4-13 to 4-14].

Given that military capability is translated through the logistics process, what is logistics? AFM 400-2, "Air Force Logistics Doctrine," provides these definitions:

> Logistics [is] the science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, [this aspect] of military operations.... deals with design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and dis-

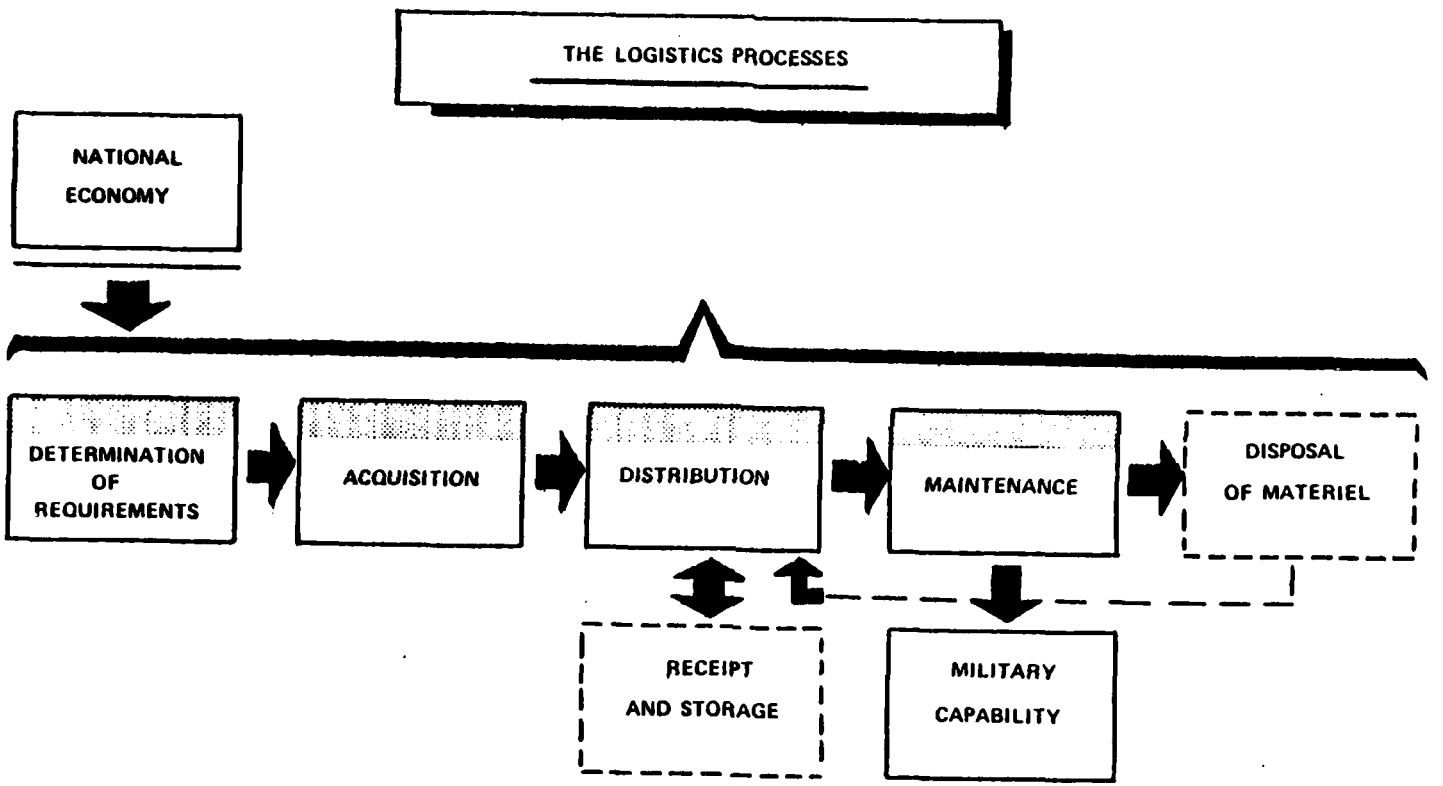

FIGURE 1.

The Logistics Process (90)

position of materiel.

> Logistics doctrine [is] a body of principles applicable to the determination of requirements for, the acquisition, distribution, and maintenance of, the resources and services integral to a military capability [91:pp. 2-1 to 2-2].

Conceptually, then, AFM 400-2 depicts military capability as the end result of the logistics chain shown in Figure 1. With some 75 percent of the life cycle costs for any given weapon system generally associated with the operational and maintenance environment, maintenance, as the last link in that chain, can significantly influence both the effectiveness and efficiency of the logistics process.

Focusing on the Maintenance Arena

To promote effectiveness and efficiency, Air Force Regulation (AFR) 66-14, "Equipment Maintenance Policies, Objectives, and Responsibilities," outlines the goals and objectives of the Air Force equipment maintenance program:

> The main goal is to keep [weapon] systems and equipment ready to perform their missions at the least cost to the Government. In order to do this, the Air Force has set up the following maintenance objectives:
>
> a. Set up and maintain the maintenance capability to carry out Air Force operations at all times.
>
> b. Make sure that Air Force maintenance organizations are designed, or are quickly adaptable, to support the wartime mission and that they can meet all operational needs.
>
> c. Set up maintenance systems and methods that can support changing operational needs and technology.
>
> d. Make sure that all Air Force material is serviceable, operable, and configured to meet the mission.
>
> e. Make sure that maintenance planning starts in the conceptual phase of the acquisition process for each new system or equipment and is kept current throughout the life of the equipment [90:p. 2].

The organizational element within the aircraft main-

tenance community with the greatest potential for realizing Air Force maintenance objectives is the base/wing level unit possessing aircraft. Consequently, considerable attention has been devoted to developing and specifying standard practices, policies, systems, and programs for the base/wing level aircraft maintenance effort. This has resulted in two basic maintenance management concepts, centralized and decentralized, which are codified in AFM 66-1, "Maintenance Management," and AFR 66-5, "Production Oriented Maintenance Organization (POMO)," respectively. In addition, there are innumerable technical orders and general directives which specify a myriad of technical and administrative requirements independent of the management concept used in maintaining a weapon system.

Within this detailed and highly-structured environment, the aircraft maintenance officer is charged with the responsibility of translating a vast and expensive array of resources into the military capability shown in Figure 1. What, then, is an aircraft maintenance officer?

The Aircraft Maintenance Officer Defined

AFR 36-1, "Officer Classification Regulation," outlines the duties and responsibilities normally associated with the aircraft maintenance officer (AMO) utilization field. The introduction to the AMO section of that regulation summarizes the more common duties and responsibilities and, at the same time, provides some insight into the range and complexity of the tasks facing an AMO:

> The Aircraft Maintenance Utilization Field encompasses the functions of program formulation, policy planning, production management, quality control, inspection, and direction of aircraft maintenance, avionics, and munitions activities. This field includes immediate supervisory and technical responsibilities for the removal, installation, modification, calibration, repair, and storage of aircraft, avionics, and munitions equipment and components. This includes aircraft engines, airframes, accessories, instruments, and aerospace ground equipment; aircraft systems and equipment to include hydraulic, mechanical, electrical, and fuel systems; bomb-navigation, offensive and defensive fire control, air launched missile control and guidance, electronic countermeasures equipment and monitor systems; manufacturing and shop equipment; photographic equipment; optical, reconnaissance, and cartographic sensors, infrared systems, television and laser systems, and associated computer systems; and air launch missile propulsion systems, aerospace munitions, release, launch, suspension, and monitor systems [88:p. A13-11].

AFR 36-1 also specifies a structure for the AMO career field based on three separate sets of duties and responsibilities, each set related to a progressively higher position within a typical aircraft maintenance organization and represented by a different Air Force Specialty Code (AFSC).

The first set, entitled "Aircraft Maintenance Officer" and represented by AFSC 4024, encompasses the grades second lieutenant through major and is described by the following specialty summary:

> Manages aircraft maintenance activities, including field, avionics, and organizational maintenance functions; the removal, repair, inspection, overhaul, and modification of aircraft, avionic, and associated ground equipment; and commands aircraft/avionics maintenance units [88:p. A13-15].

The second set, entitled "Maintenance Staff Officer" and represented by AFSC 4016, encompasses the grades major through colonel and is described by the following specialty

summary:

> Administers and manages maintenance activites for assigned primary maintenance (aircraft, avionics, and munitions) programs, including related support equipment and facilities; and commands aircraft, avionics, and munitions units [88:p. A13-13].

The final set, entitled "Aerospace Maintenance Director" and represented by AFSC 4096, encompasses lieutenant colonel and colonel, and is described by the following specialty summary:

> Directs and monitors aerospace maintenance and related material programs, including planning and budgeting for design, modification, and repair of aerospace vehicles, munitions, and related facilities and support equipment; commands large consolidated maintenance units; serves as wing/base Deputy Commander for Maintenance (DCM)/Chief of Maintenance; and serves as senior maintenance advisor to commanders and senior Air Staff chiefs [88:p. A13-19].

Yet these specialty descriptions, even in complete form[2], highlight only the major tasks encountered by an AMO in a typical maintenance organization. A greater appreciation for the flavor and scope of the responsibilities facing an AMO may be achieved by reviewing Table 1, which provides a list of some jobs an AMO might hold.

Complementing variety among jobs is an inherent variety within jobs. A flightline officer in a tactical environment faces distinctly different challenges than a flightline officer with strategic forces, as well as a different maintenance management concept and organizational structure. An F-15 wing DCM in Arizona confronts a different set of environ-

[2]Complete specialty descriptions for each AFSC are included in Appendix M.

TABLE 1

Typical Jobs Held by an Aircraft Maintenance Officer

Flightline/Aircraft Maintenance Unit (AMU) OIC
Transient Services OIC
Job Control Officer
Quality Control/Quality Assurance Officer
Propulsion Branch OIC
Aerospace Systems Branch OIC
Fabrication Branch OIC
Programs and Mobility Officer
Aerospace Ground Equipment (AGE) Branch OIC
Logistics Planner
Maintenance Training OIC
Plans and Scheduling Officer
Avionics Branch OIC
Depot Level Maintenance Officer
Alert Branch OIC
Materiel Control Officer
Maintenance Supervisor (for any maintenance squadron)
Field Training Detachment (FTD) Commander
Headquarters Staff Officer (at any level)
Technical/Academic Instructor
Maintenance Control Officer
Maintenance Squadron Commander
Chief of Maintenance
Deputy Commander for Maintenance (DCM)

mental problems than a DCM for an F-15 wing in Okinawa, Japan. A maintenance supervisor for a C-141 organizational maintenance squadron deals with a different set of technical difficulties than a maintenance supervisor for a C-141 avionics maintenance squadron. Thus, organizational, geographical, environmental, technical, and other differences interact to make each and every job unique. With such diversity in possible job assignments, there is considerable controversy about what common skills and qualities, if any, an AMO must possess.

The Manager/Technician Debate

One of the longer-lived issues concerns the roles managerial skills and technical knowledge play in determining the effectiveness of an AMO. The debate centers around the relative contributions of managerial abilities and technical knowledge toward an AMO's success, and the degree of importance of each attribute as a complement/supplement to the other. On the one hand, managerial skills are obviously necessary to plan, direct, coordinate, and control the efforts of scores of individuals in a multitude of specialties, using hundreds of parts and spares in accordance with specific technical and administrative requirements, to prepare complex and sophisticated equipment for a variety of possible uses. On the other hand, technical knowledge is necessary to provide a focus for the managerial skills: to understand the capabilities of the specialists, to know what parts and spares are critical to mission performance, to appreciate the need for the technical requirements, and to schedule equipment for use.

While it is intuitively obvious that the answer must incorporate some combination of both, the debate continues. As it lingers, it fosters more questions. If there is an ideal combination, does it shift during a career, and if so, in what direction? Assuming the requisite skills and qualities, whatever they are, can be taught or instilled, at what points in the career pattern are they best introduced or reinforced? Is there a career progression pattern which optimizes or enhances the developmental process?

Why Do We Need Answers?

The manager/technician controversy is far from being simply an academic question. While any given ratio will certainly not apply in all circumstances, it may be possible to determine a range of combinations which encompasses either a majority of similar situations or a variety of organizational levels. The implicit importance of such a determination may be traced directly to the curricula of the courses which prepare an AMO for duty in the career field, and to the career development process. For example, if the normal duties and responsibilities of the entry-level AMO are more directly tied to technical knowledge, then the curriculum of the entry-level school, the Aircraft Maintenance Officer Course (AMOC), should be structured to reflect that apportionment. Similarly, if the career progression pattern reveals that AMOs require a greater proportion of managerial skills as they move up in rank or responsibility, then subsequent training should support that shift in emphasis.

Links to the Past

Criticisms of the AMO training and development process are nothing new. In a 1971 thesis for the Air Force Institute of Technology (AFIT), Lieutenant Colonel Howard P. Kenney (38) voiced concern over a lack of USAF policy and guidance to support career counseling and planning, and revealed a pervasive ignorance concerning the actual duties and responsibilities associated with both field and staff assignments. In a 1975

research study for the Air Command and Staff College (ACSC), Major Paul Cwiklik (18) addressed the paucity and inadequacy of available training for inexperienced senior officers becoming chiefs of maintenance. In another ACSC research report, Major Albert R. L. Schmidt (74) challenged the practice of assigning rated, and relatively inexperienced, officers to maintenance squadron commander positions.

Since 1980, several studies have reiterated these old problems, as well as highlighted new ones. In a 1980 AFIT thesis, Captains David M. Komar and William M. Wise (41) identified weaknesses in both the formal and informal programs for management development. In that same year, Captains Joanne M. Flanigan and Laurence J. R. Little (25), in another AFIT thesis, discovered that many maintenance officers were dissatisfied with the technical training they had been afforded, terming it "insufficient and irrelevant." Major Douglas D. Stormo (79), in a 1980 ACSC research report, focused on the "failure of basic technical training to prepare new [maintenance] officers for management responsibilities encountered in today's....maintenance squadrons." Finally, in yet another 1980 AFIT thesis, Captains Edward D. Mayfield and Robert W. Walter (50) investigated problems with training and assignment flexibility for AMOs, especially in terms of major command stagnation.

Problem Statement

> We....are vitally concerned [with] the development of a strong, professional maintenance officer force....We

> believe there is sufficient cause to doubt that the current AMOC can produce students with the basic skills required....In recent years, particularly since the amalgamation of the Avionics and APG [Airframe and Propulsion General] streams, we have witnessed a continued erosion in the instruction provided to our maintenance officers [27].

In the above portion of a 1979 letter to the Air Training Command (ATC) technical training staff, Strategic Air Command (SAC) Deputy Chief of Staff for Logistics, Major General Martin C. Fulcher, echoed a universal concern within the aircraft maintenance community over the decreasing relevance and deteriorating effectiveness of AMOC training. A further, and complicating, concern is an unfavorable trend in the experience level of available maintenance officers, from an average of 5 years in 1977 to about 3 years in 1980 (79). This declining experience level, coupled with a high accession rate to fill shortages (72) and the existence of two different maintenance management systems, presents a significant training problem.

The Air Force currently lacks a comprehensive and consistent policy for AMO training and career development (49; 58) The AMOC curriculum, for example, inefficiently duplicates accession training and Squadron Officer School (SOS) course content, which are both totally oriented to management. Furthermore, senior maintenance managers (9; 40; 49; 68; 69; 71; 72; 92) feel that the AMOC curriculum fails to adequately prepare the neophyte AMO for the duties, responsibilities, problems, and challenges confronting him through his first few assignments, much less a career. Finally, the responsibility for

career development, while certainly an individual one, is shared with the Air Force Military Personnel Center (AFMPC) PALACE LOG division, which is somewhat limited in its knowledge of an individual's talents, skills, and aspirations, as well as in the variety of assignments open at any given time.

Research Objectives

The objectives of this research are to critically review the AMOC curriculum through AMOs' perceptions of its utility and relevance, to identify the significant difficulties in the AMO career development and progression process, to develop and recommend a life-cycle model for AMO career development and progression, and to stimulate further research into discovered problems by providing a seminal work which can be built upon and expanded.

Research Questions

1. To what degree do AMOs perceive the current AMOC curriculum as relevant to the managerial and technical responsibilities encountered by them in today's environment?

2. To what degree do AMOs perceive a need for training beyond the courses currently available?

3. To what extent do AMOs consider their duties and responsibilities to be managerially- and/or technically-oriented?

4. Is the current AMO career development and progression pattern relevant to the life-cycle of an AMO?

CHAPTER II

LITERATURE REVIEW

Introduction

> Those who fail to learn from history are doomed to relive it.
>
> --George Santayana

We are frequently reminded that the military is not separate from, but a microcosm of, the society in which we live. Our personnel come from that society and return to it when they leave military service. In much the same way, knowledge flows from the civilian community to the military and back again. Thus, as we search for solutions to the problems we encounter, we must not neglect the possibility that society may have already provided us with an answer.

Purpose, Organization, and Scope

The purpose of this literature review is two-fold: to survey contemporary personnel management philosophies, theories, and applied programs for career planning and development in the civilian sector, and to examine documented military research efforts relating to the training and career development of the AMO. Therefore, we have arranged this literature review in accordance with those two stated purposes. After we discuss those sources explaining generic programs or reporting civilian research efforts, we conclude with a review of several specific military studies.

Throughout this review, we do not attempt to recommend

or endorse any specific career planning and development program. Instead, we hope only to define career planning and development, in theory and in practice, and to create a conceptual framework from which to derive subsequent discussion.

Survey of Civilian Literature

Our search of the civilian literature relating to career planning and development was confined to the AFIT Library, the Wright State University Library, and the University of Dayton Library. We further limited our search to articles and studies completed since 1970. Yet, even under these limitations, we discovered a growing and expanding body of knowledge appearing increasingly more frequently in such prestigious forums as Annual Review of Psychology, Academy of Management Journal, Training and Development Journal, Human Resource Management, and Organizational Dynamics.

Introduction

Career planning and development is the formal process of establishing individual career goals and integrating them with organizational objectives to the mutual satisfaction and benefit of both the organization and the individual (4:23-29; 6:53; 39:382; 43:283-287; 55:33; 75:49-52; 93:830-832; 95:4). An important distinction between the organization and the individual is that while organizational career planning and development justifiably presupposes and requires individual interest or participation, individual programs do not necessarily require an organizational setting for fulfillment.

Practical Examples

Although it is a relatively recent innovation in human resource management, formal career planning and development, both in theory and in practice, has rapidly achieved significant success and support in civilian applications, and its importance as a tool for enhancing organizational effectiveness has been repeatedly and reliably demonstrated (37:5; 55:33-37). More and more organizations are using, or are in the process of developing, career planning and development programs.

General Foods Corporation (20:47) pioneered in the practical application of organizational career development theories. Some of the techniques used there include self-assessment workshops, on-site college courses, college orientation sessions, internal job fairs and clinics, and goal-setting workshops.

General Electric's Management Development Institute (55:35) developed a unique set of career planning workbooks and a series of associated workshops to analyze and apply the results of self-assessment.

At Minnesota Mining and Manufacturing (55:36), a "corporate career-growth program" is based on five elements:

1. An overall communication program featuring meetings, informal referrals, and communications to increase awareness and use of program services and to broaden understanding of the term "career."

2. A career information center with information about company jobs and career paths, current literature on career planning, self-development programs, and easy access to the career

counseling staff.

3. Management training on career counseling.

4. Career growth workshops to aid in assessing one's self and one's current job as a base for growth, making action plans, and holding discussions with one's supervisor.

5. Transition workshops that provide intensive help on self-assessment and active job-search techniques for those identified as available for transfer.

Last but not least, International Business Machines (55:37) began an employee development program on a corporate-wide basis. This program is supported by managerial training in counseling and by brochures for both managers and employees. The employee, by use of the descriptive brochure and/or cassette, is encouraged to do some precounseling planning by preparing answers to a set of questions. The key element in this program is a voluntary annual discussion between the employee and the manager about career, personal growth, and development growth interests. In addition, many company locations have developed career workshops, workbooks, and other more extensive supports for individual career management and planning.

Individual Career Planning and Development

Introduction and Definitions

> Organizations can only be as flexible, adaptive, and creative as the people they employ. People bring organizations to life. If organizations are to be effective, their people must perform effectively. Therefore, to improve the functioning of an organization, it is necessary

to maximize the development and utilization of its human resources [31:205].

Contemporary writers, researchers, and theorists in personnel management and organizational dynamics generally recognize and agree that the cornerstone of any career development process is the individual (7:31; 16:10; 30:282-290; 31:205; 56:11; 75:48; 82:336; 84:41; 94:2; 95:6). As described by James W. Walker and Thomas G. Gutteridge (95:6) in an American Management Association survey report, individual career development planning is "the process of setting individual career objectives and devising the developmental activities necessary to achieve them." Implicitly, then, the individual must initiate, and remain actively involved in, career planning. Throughout this process, the individual should continually analyze his interests, values, capabilities, and objectives, evaluate current and future opportunities in the organizational setting, and establish a development plan that he hopes will yield success.

Contemporary Viewpoints

John J. Leach (43:283-287), director of career studies for the Human Resources Center at the University of Chicago, characterizes the individual career development planning process as the successful application of four fundamental elements. The first element, direction, involves a thorough, objective assessment, by the individual, of his career goals and the ability of the organization to meet them. The second element, career time, simply means setting a rational and achievable timetable for meeting career goals. The third element,

transitions, relates to the changes in knowledge, skill, and behavior necessary as the individual progresses up the career ladder. The final element, outcomes, involves the individual's acceptance that, at best, the entire career planning process is based solely on the probabilities of future events, and that his investments and sacrifices for career progress may not bear fruit.

Robert Barkhaus and Charles Bolyard (6:55-56), directors of career development at Indiana University and at Lincoln National Life Insurance Company respectively, note that career development planning, though allowing greater individual participation in the career process, also implies an individual responsibility to:

> 1. Develop a positive attitude toward work, and understand the implications of personal fulfillment through the job.
> 2. Work up to present potential while striving to raise that level of capability, and try to gain as much as possible from each work or educational experience.
> 3. Listen to and learn from experienced peers and supervisors, but remain willing to take risks and to express ideas.
> 4. Evaluate personal needs as they relate to the capacity of the job to meet those needs, and take advantage of education and training programs provided by the organization.
> 5. Establish a good performance record. Develop both short- and long-term career goals, and discuss them with supervisors.
> 6. Realize that change is a fact of life and learn to appreciate the opportunities change affords.

Douglas T. Hall and Marilyn A. Morgan (31:224) endorse and expand the responsibilities highlighted by Barkhaus and Bolyard, and provide sage advice as they introduce a guide for self-management:

> The organization you work for and chance events have a lot of control over your career, but that control is not absolute. Develop some career goals and do some career planning.

For individuals to gain some degree of control over their career, Hall and Morgan recommend they:

> 1. Develop career maturity by establishing competencies in: self-appraisal, obtaining occupational information, problem-solving, planning, and choosing goals.
> 2. Get realistic information about opportunities.
> 3. Select the most challenging jobs whenever possible.
> 4. Develop communications and human relations skills.
> 5. Avoid overspecializing, thereby maintaining flexibility and forcing learning and growth.
> 6. Reassess their career periodically and make adjustments as necessary.

Conclusion

In summary, career development and planning is, first and foremost, an individual responsibility. Once the individual process is begun, however, it assumes a much greater practical significance when it can be consummated within a receptive and accommodating organizational setting. Thus, the organization becomes the other central participant in the career planning and development process.

Organizational Career Planning and Development

Introduction and Definitions

As the individual provides the cornerstone, so the organization completes the foundation of the career planning and development process.

> Isn't the career the employee's own business--a private matter? Not really. For one thing, a person's career experiences and outcomes affect his or her perfor-

> mance, absenteeism, work quality, and turnover, all of which mean plus or minus dollars to the organization. For another, careers are a target for implementing equal employment opportunity. For many managers, in fact, career development and affirmative action are synonymous. For a third thing, one's work career is a major input to overall quality of life. People now have greater mobility and personal freedom than in the past, making it easier to achieve career fulfillment, which in turn puts more pressure on a person's employer to provide satisfying career opportunities. And, finally, given a sluggish, slow-growth economy, career opportunities have become more limited, making career planning more important if the person's career goals are to be met [31:205].

Hall and Morgan (31:212) succinctly reflect the consensus of the management community (7:23-35; 15:611; 28:8-11; 35:118; 82:336) when they define the organizational career development and planning process as "facilitating self-management of careers by assisting the individual in planning expected progress through the organization and creating an organizational climate conducive to individual self-management efforts." Thus, the organization must create and foster the policies, programs, attitudes, and skills to aid the individual in his development plan, insuring that realistic expectations are not supplanted by, or equated to, raised expectations (94:3).

Contemporary Viewpoints Continued

W. D. Hessel (33:95-96), in suggesting a commonality among virtually all management development programs, recommends further that such common elements become these program's basic operational objectives:

> While the objectives of any management development program must be established to meet each agency's needs, there are some common elements:

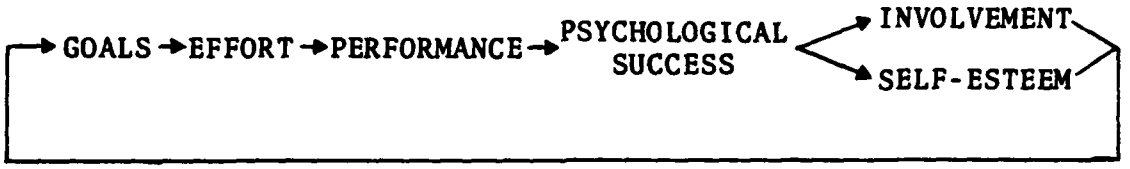

FIGURE 2.

Model of the Goal-Setting Process (30)

1. To eliminate the myopia that many employees bring to their first management experience, particularly when they have risen through the ranks from a technician's role.
2. To increase skills in decision-making and in interpersonal relations.
3. To gain increased understanding of the causes of basic problems, particularly the social problems perplexing urban societies.
4. To improve inter-departmental and inter-agency cooperation.
5. To overcome specific deficiencies in individuals caused by gaps in their preparation and experience.

In 1977, Douglas T. Hall and Lawrence W. Foster (30:282-290) published the results of a study designed to determine the psychological basis for an individual's career behavior. Through the use of a simulated management environment, they established the model shown in Figure 2 by demonstrating the causality of each link in the model chain.

The relevance of this model becomes more readily apparent when one realizes career development planning is simply an iterative process stimulated by a series of successes and failures. Each step up (or down) the organizational ladder requires the individual to revise both the immediate and the long-range

goals to accommodate this change. Thus, an organization's career development efforts should be focused toward improving the ratio of successes to failures, resulting in dollar savings for the organization and salvaged self-esteem for the individual.

According to Dr. Mohammed Fazel (22:46-53), assistant professor of psychology at Purdue University, organizational career planning and development programs may be categorized in one of three ways: reactive, mechanistic, or interactive. In the reactive, or traditional, approach to career development programs, the organization usually responds to developmental requirements only as managerial vacancies arise. Thus it reacts to career problems rather than developing subordinates beforehand. The mechanistic approach either relies on packaged, commercial programs, or implements universal, non-specific solutions. The administration of this approach is normally vested in a staff function which serves in an often conflicting role as the consulting agency for both the organization and the individual. The interactive approach focuses on the ongoing environment as the key determinant of career growth. Using the interactive view, the organization transcends the bounds imposed by the formal structure and "through greatly expanded and informalized communication, reaps considerable developmental results by exposing the employee to a much more varied work environment."

Marilyn A. Morgan, Douglas T. Hall, and Alison Martier (57:3-30) take a more utilitarian approach and classify career

programs in organizations into seven main categories:

1. Career counseling, which includes psychological assessments and career alternative planning.

2. Career pathing, such as planned job progressions, departmental rotations, and career ladders.

3. Human resource activities, such as computerized skill matching and proposed managerial replacement charts.

4. Career information systems, such as job posting.

5. Management development, which includes job broadening and assigning responsibilities for career development to line supervisors.

6. Training, including seminars, internships, tuition assistance, and technical courses.

7. Special group programs, such as preretirement counseling, outplacement counseling and assistance, and minority indoctrination training.

But once again, Barkhaus and Bolyard (6:56-57) emphasize that there are inherent responsibilities the organization must accept and meet:

> 1. Recognize that employees are an organization's most important and valuable asset, and that, for this reason, career planning and development programs are both necessary and advantageous.
> 2. Evaluate individual career potential and provide adequate and accurate feedback of that assessment to the individual.
> 3. Fully involve managers at all levels in the career development process so they may become more aware of developmental concerns and concepts.
> 4. Provide employees with as many and as varied work experiences as possible so they may develop a better understanding of themselves, their skills, and their organization.

5. Assist and participate in educational and community career development programs.
6. Support midlife career changes with in-house transfers or outplacement assistance.

John C. Aplin and Darlene K. Gerster (4:28-29) of Indiana University have advanced four conditions which they conclude must be met for program success. First, top management must support career development, not only by providing the substantial amounts of resources necesssary, but more importantly through commitment to the goals of career development. Second, career development counselors must have the authority to ensure employee confidentiality. Third, introduction of the career development program and counselor into the organization must be a gradual, evolutionary process. Finally, career *development* must have an appropriate position within the organizational hierarchy.

"But is individual career planning consistent with the objectives and practices of a well-managed business?" James W. Walker (94:2-5) poses this question in his article, "Does Career Planning Rock the Boat?" Certainly career planning, like any other organizational issue, is not without risks to be balanced against the rewards. The list of possible risks, according to Walker, includes unrealistic expectations, increased turnover, burdened supervisors, additional strain on the existing personnel programs (training, education assistance, internal placement, and job posting), as well as increased employee anxiety about future work in relation to personal interest, abilities, and goals. Yet in spite of these

risks, companies are still developing and implementing career planning programs. The reasons for this are twofold: outside pressures and the inherent advantages of these programs.

The pressure comes in several forms: ambitious and highly sought potential employees tend to lean toward companies that exhibit career advancement opportunities; employees are aware of the advantages of career planning; affirmative action programs and discrimination suits have forced many companies to adopt such programs; and growing companies depend on a pool of talent being available when needed.

The list of inherent advantages to these programs reads like a mirror-image to the risks, including decreased turnover, improved on-the-job performance, minimized chances of white-collar union actions, and more realistic career expectations. Walker earmarks this last advantage as the key to effective career planning. He observes that companies that had effective career planning programs had given their employees realistic expections by guiding them toward opportunities and resources which were actually available. The process is illustrated in Figure 3.

> Telling employees a straight story about career options builds employee commitment to the company and helps avoid "rocking the boat"....Realistic expectations lead to clarification of supervisor's roles and career development responsibilities, more effective employee use of a company's career development system, and strengthened individual abilities to carry out career planning in a practical, meaningful way.

In his conclusion, Walker points out that the ultimate goal of a career planning program is not to plan employees'

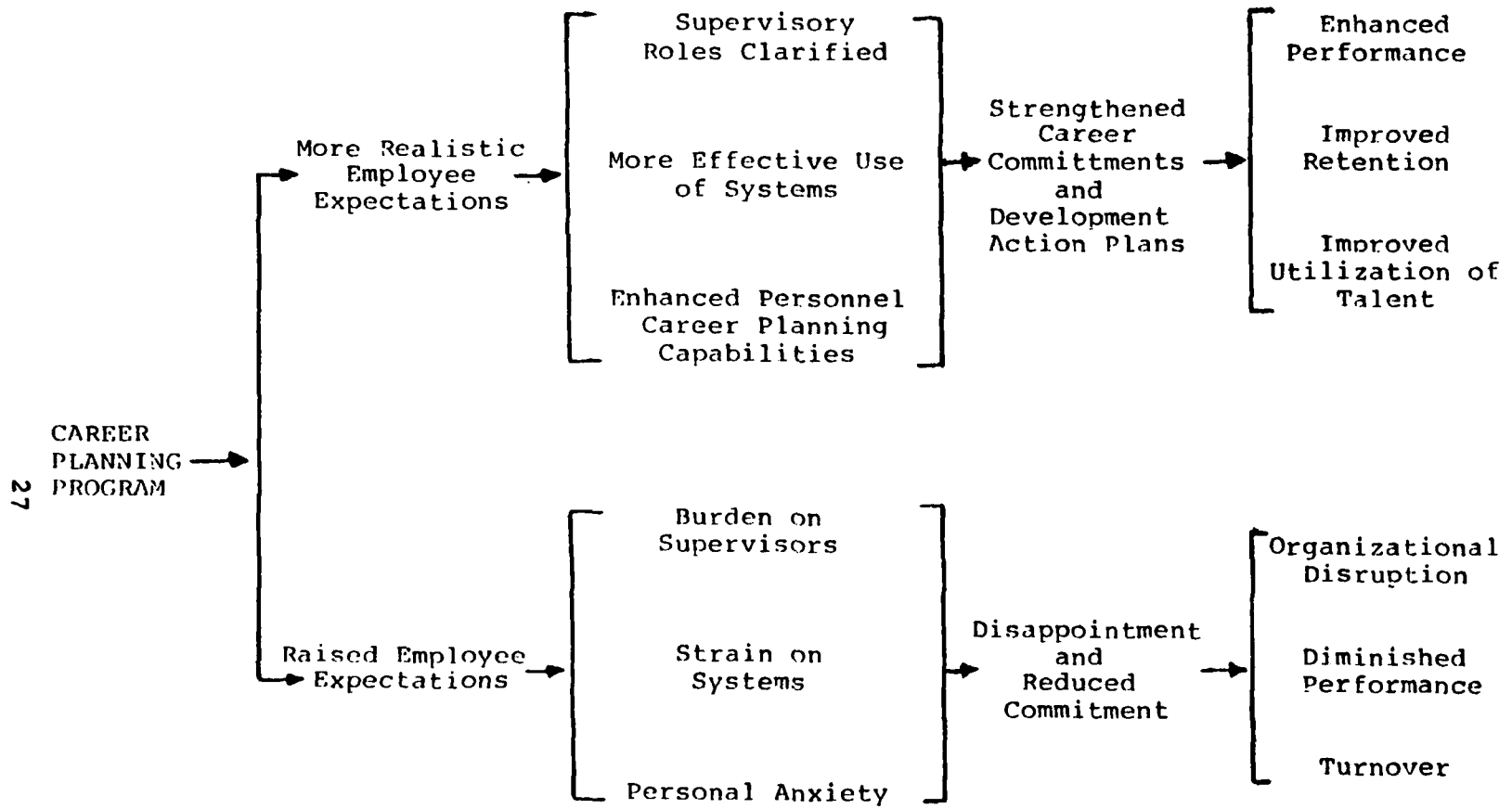

FIGURE 3.

The Effects of Career Planning (30)

careers, but to give them the skills and opportunities to do so themselves.

Problems and Weaknesses

Career planning and development programs are not without acknowledged difficulties. While these often result from tenuous and incomplete applications of the programs rather than from the programs themselves, some programs also suffer from the trauma of the transition from academia to the real world. Robert McAvoy (51:59), director of career development at Applied Human Technologies, emphasizes the ultimate result of these weaknesses. In his view, the growth of executive search and outplacement firms bears witness to a general organizational and managerial inability to identify and develop internal talent. He attributes this not to any fallacy in the concept of career development, but rather to management's poor administration of sound programs.

Wilford G. Miles and William D. Biggs, (53:32-25) associate professors of management at Alfred University, claim that "six common, recurring, and avoidable errors account for a substantial percentage of [management development program] failures." The first is failure to tie development programs to long-run or strategic considerations. The result is likely to be a series of training activities which relate neither to each other nor to organizational needs. This makes management development essentially a random activity and renders it expendable due to its lack of cen-

trality to organizational purpose. Failure to properly qualify participants is another common error. The proper technique, according to Miles and Biggs, is to search the appraisal reports to identify clusters of common deficiencies around which to build the needed programs. A third failure is in the use of improper training methods, for all too often the programs are designed for the ease and convenience of the instructor rather than for the benefit of the participants. Other failures include not differentiating between individual and group development, not providing posttraining support, and not evaluating results.

Lynda L. Moore (56:44), a career counselor and consultant with the Community Development Center at the University of Massachusetts, claims that career planning programs often suffer from any one or all of three common weaknesses. First, there is rarely a connection between career planning and development for individual employees, and corporate human resources planning and management aimed at organizational staffing needs. In essence, career planning programs are not viewed from a systems perspective and, as a result, have not been fully integrated into the organization. Second, many reer planning activities and techniques, devised in laboratory-like isolation or in classroom settings, are unrelated to actual job requirements or experiences. In such instances, career planning has had little connection with either the employee's organizational career or his real developmental needs. Lastly, many career planning systems are overly com-

plex, consisting of complicated planning exercises and computerized self-assessments that require vast amounts of time.

Evaluation Techniques

Sharon L. Connelly (16:8-11), in "Career Development: Are We Asking the Right Questions?" reports the development of a guide designed to assess the applicability of a career development program. This guide has been designed to answer some of the questions policymakers frequently ask, such as whether or not a career development program is the answer, what kind of results can be expected, and what type of program would be best. By carefully following the process this guide outlines, the users are "guided" toward describing what it is they are trying to accomplish, the nature of the problems to be considered, and the goal of the solutions. The guide is split into the seven sections summarized below:

1. Section I asks the user to develop working definitions of several terms as they apply to their organization. Terms selected include life planning, career, career development, career planning, and career management.

2. Section II asks the user to identify those forces which influence development or nondevelopment of a program. It then asks, "How, if at all, do these pressures and others like them affect what you are doing, or what you think you should do, to meet the needs of your organization and its employees?"

3. Section III addresses the purposes and assump-

tions affecting the design and thrust of the program. Careful analysis of this section helps the organization insure an individual approach to their special problems by considering such topics as organizational purpose, individual purpose, assumptions oriented to the organization, and assumptions oriented to the individual.

4. Section IV considers potential risks and benefits to both the organization and the individuals. Organizational areas considered include productivity, utilization, adaptability, stability, competitiveness, and compliance. Individual topics include self-determination, personal growth, enhanced employability, health and well-being, and quality of life.

5. Section V begins the planning and developmental stages of the program. In this section, the user describes the program by target population, organizational penetration, and program content.

6. Section VI looks simply at administrative considerations.

7. Finally, Section VII completes the process by tracking and communicating results. This section gives the process a cyclic, iterative nature by permitting reviews, thus promoting flexibility and responsiveness to change.

This guide was designed to introduce structure into the career development program building process. While it is not all-inclusive, Connelly considers it an enviable effort that promises to yield beneficial results simply by

providing a framework within which to tailor such programs to the organization involved.

In "How Companies Evaluate Management Development Programs," Lester A. Digman (19:9-13) surveyed the chief executive officer (CEO) of corporations ranking in the top 500 in terms of assets, sales, market value, and net profit, plus those ranking in the top 250 in terms of number of employees while having at least one other ranking in the top 500. Of the 289 companies surveyed, 47 responded. The median respondent had 42,000 employees, 126 executives, 1,024 middle-level managers, and 2,527 supervisory-level jobs. The CEOs were asked to rank the methods used to evaluate the effectiveness of developmental efforts. The top three answers in order of preference, were the judgment of higher-level management, participant evaluation some period of time after program conclusion, and participant reaction at the conclusion of the program. When asked what measures of efficiency were used to evaluate career development programs, CEOs usually responded with one of the following four answers: use of resources, participant feedback, management judgment, and performance appraisal. The significance of the measures of efficiency question surfaces when one realizes that effectiveness is often more difficult to determine than efficiency. Digman notes that since the benefits of more sophisticated measures usually do not warrant the costs involved in their use, companies tend to employ relatively basic evaluation measures, and roughly half feel that there

is no urgent need to change.

Some Specific Prescriptions

Scott B. Parry and Edward J. Robinson (63:8-13), consulting psychologists for Training House, Incorporated, maintain that understanding the definitive

> ....distinction between training and education is critical to an organization's understanding of what it wants to accomplish in its management development programs....
>
> Education is concerned with broad, general objectives that are often expressed in terms of values, attitudes, and perceptions....and might be thought of as a socialization process for integrating members into the ranks of management....
>
> Training is concerned with specific, job-related behaviors [usually] expressed in terms of procedures, rules, and techniques [which] can be observed and measured in new behavior and improved performance.

They stress that organizations must devote far more time and energy to determining the goals of management development than they have in the past. Ideally, the process of needs analysis is the first step. This may be accomplished through several useful tools:

1. Needs inventories, which list the skills and abilities requiring development throughout the organization.

2. Critical incident surveys, which document actual situations for use in case studies of specific individuals or the organization.

3. Climate surveys, which measure the attitudes, opinions, and perceptions that constitute the organizational atmosphere.

Parry and Robinson contend that tailored organiza-

tional and individual programs hold the greatest promise for success. Such tailored programs must contain the appropriate mixture of education and training to alleviate the deficiencies identified by the needs analysis.

In closing, they offer the following observation and advice:

> A company's management development program is often monolithic and unresponsive to individual differences in need....By moving away from the traditional monolithic programs and toward flexible modular programs, we can score much greater impact on individual and organizational performance. And that's what management development is all about.

In an article entitled "An Individual Management Development Approach," Fred Luthans, David Lyman, and Diane L. Lockwood (48:1-5) argue that the typical approach to organizational management development is to conduct a survey of training needs and design the program around the average results. The outcome is a program which fits no one individual, but the impersonal average. They propose a new perspective:

> Individual management development (IMD) is based on the premise that management development programs are most effective when:
> 1. Individual managers have direct input into assessment of their own needs and subsequent development plans.
> 2. Immediate supervisors are directly involved with assessment of subordinate's development needs on a one-to-one, personalized basis.
> 3. Individuals are given responsibility to monitor their own performance-related behaviors.
> 4. Individuals receive immediate, objective feedback on development progress.
> 5. Programs are modified on an individualized and ongoing basis.

Perhaps the greatest advantage to an IMD is the individualized approach itself. According to these authors,

numerous studies have shown that if a person is permitted to participate in the decision processes affecting him, he will be much more committed to the program and it will have a higher probability of success. Such participation, coupled with frequent, positive reinforcement, creates an atmosphere more conducive to prompting the desired behavior. The end result is an individual who reaps beneficial development and an organization with higher morale among its managers.

To develop an IMD program, the organization should identify the specific behaviors necessary for effective managerial performance and group them into developmental categories. After the manager and the immediate supervisor concurrently (but separately) evaluate the manager's behavior, they compare results, thoroughly discussing those areas where differences of opinions are reflected by the evaluations. It is crucial that the results of this program remain divorced from the performance appraisal/promotional aspects of the job. Two or three areas are then chosen for development. Finally, the manager and a development expert construct an individualized program designed to promote the desired behavior. Obviously, the manager's participation in this entire process is the key to its success.

The authors, in claiming significant benefits for the IMD program, say it:

1. Forces managers and their bosses to think through and articulate their perceptions on what constitutes effective managerial performance.
2. Provides a prior specification of job behaviors

critical to managerial effectiveness.

3. Encourages self-control by placing primary responsibility for monitoring designated on-the-job behavior with the managers themselves.

4. Provides for continuous management development by reassessing needs on an ongoing basis.

The greatest drawback to the IMD is the time involved for the managers, for the supervisors, and for the development specialist who conducts the recurring counseling and follow-up.

The final area for review, the assessment center, has received a significant amount of acclaim in recent years, both as a career development method and as a job selection technique (10; 12; 32; 36; 41). The last decade has seen such diverse organizations as American Telephone and Telegraph, International Business Machines, Standard Oil of Ohio, Sears-Roebuck, the Department of Agriculture, General Electric, Ford Motor Company, Eastman Kodak, and Merrill Lynch join the list of firms using assessment centers.

William C. Byham (12:24-28), president of Development Dimensions International, gives three reasons for this rapid growth. First, documented studies at American Telephone and Telegraph, Sears-Roebuck, and Standard Oil of Ohio show that candidates chosen by assessment center methods are two to three times more successful in higher management positions than counterparts chosen by supervisory judgment. Second, the assessment center technique is a combination of management assessment and development, thereby cutting down on the cost of two different functions. Lastly, the techniques used lend themselves to quick management acceptance because they "look

valid and make sense."

Assessment centers are generally used for personnel selection, especially from the supervisory level to the management level. A typical center begins with approximately 12 employees who were selected by their immediate supervisors for demonstrating the potential to advance to specific management positions. Over the next few days, these employees go through a series of simulated tasks designed to test attributes the organization feels important, group discussions, individual exercises, and interviews, all under the watchful eyes of the assessors. At the end of this period, the assessors compare notes and write summary reports on the results. These reports, given to both the employee and management, include perceptions of the employee's potential and recommended development actions.

The assessment data covering individual developmental needs can then be used for two things: a basis for developmental resources allocation and, when combined with several other assessment reports, a survey of organization-wide development program needs. Another useful by-product of the assessment center is the experience itself. After an individual goes through the exercises and simulations, he is given constructive feedback on his performance. Many people have gained a certain degree of self-insight concerning their reactions, and have learned how others evaluate their performance. The end result is a more effective training effort, since the humbling assessment center experience tends to

sensitize managers to their need for development, a process Byham calls "sensitizing the unfreezing process."

Another important attribute of the assessment center, according to Byham, is the training the assessor inherently derives from the experience. The assessors, who are generally line managers two or three levels above the participants, benefit in several ways:

1. Improvement of interviewing skills.
2. Broadening of observation skills.
3. Increased appreciation of group dynamics and leadership styles.
4. New insights into behavior.
5. Strengthening of management skills through repeated working with in-basket case problems and other simulations.
6. Establishment of narrative standards by which to evaluate performance.
7. Development of a more precise vocabulary with which to describe behavior.

But Byham says the assessment center is not without drawbacks. First, it relies on the supervisor's nomination of the employee. Some high potential employees may never be nominated simply because qualities like aggressiveness, intelligence, and curiosity are not always appreciated by lower-level supervision. Supervisors afraid of losing their job to younger, more ambitious employees, or who experience a personality conflict, can completely invalidate the impartiality of the assessment center. Remedies might include self-nomination, or personnel department nomination based on records and a documented desire to attend. A second problem is the effect not being nominated or doing poorly can have on an employee's attitude. Organizations which rely on assessment center

results as a basis for promotion have found this leads to turnover among such employees. If this is not desired as a method of eliminating the "deadwood," it might be corrected by putting less emphasis on center results for promotion. Lesser problems include anxiety and cost. Like a test, some people get anxious in the center atmosphere, particularly if future promotions could hinge on their performance. The cost is totally dependent on the individual organizations. If employees have to be brought from all over the world for one or two weeks, cost will be considerably higher than for a one-plant operation.

The Marriage of the Individual and the Organization

Integrating individual goals with organizational objectives yields synergistic results. In highlighting some of the benefits of an effective organization career planning and development program, experts state that it:

1. Provides the needed integration and coordination of managers' career plans and the organization's human resource needs (93:836).

2. Shows the organization's genuine interest in the career process and the progress of the individual (93:837).

3. Creates greater management familiarity with, and involvement in, general organizational problems and plans (93:837).

4. Monitors critical managerial functions (8:69).

5. Encompasses all levels of management simply by

placing the primary operational responsibility for organizational career planning and development directly upon the first-line supervisors (73:376).

6. Enhances the confidence of top management in subordinate managers' skills and capabilities (29:42).

7. Requires realistic presentation of promotional opportunities (39:389).

We see then that career development promises significant improvements for both the individual and the organization. But John J. Leach (43:286) provides these warnings for the unwary manager:

> 1. All problems of the firm are not career development problems.
> 2. Many employee career complaints also relate to psychological culture and climate features of the firm.
> 3. The higher employees advance within the hierarchy, the more candidates there are for fewer and fewer positions.
> 4. Many personnel departments introduce career planning programs without first anticipating and preparing for the new roles supervision will have to play.

Conclusion

Although the basic tenet of career planning is not new, the contexts in which it is being defined and applied make it seem new. While the individual must be the central figure in the process, organizational emphasis is increasing toward a more balanced equation. Through the application of creative techniques and with continued cooperation and support from management, career planning and development programs, properly applied and administered, promise to invigorate organizations and drive out some of the stale and plastic

approaches of the past.

Survey of Military Studies

Introduction and Organization

Our search of military literature sources included the Air University library system, the Defense Logistics Studies Information Exchange, and the Defense Technical Information Center. We found that little had been written about training and development of the AMO, but the few studies that had been done repeatedly pointed to problems within the AMO field. The following military studies are arranged chronologically and encompass the bulk of the documented research on training and development in the AMO career field. These studies, dating back some 16 years, reflect a growing concern over the continuing, multifaceted problems associated with training and developing a professional AMO force.

Major Kenneth C. Culp (1966)

The earliest work reviewed was Major Culp's (17) ACSC paper, "Education of USAF Aircraft Maintenance Officers," in which he suggested that "the USAF aircraft maintenance officer educational system had not kept pace with the increased complexity of the maintenance environment [17:1]." He postulated that if AMO training could be divided into technical and managerial dimensions, the problem would be reduced to determining the amount of training necessary in each area. Major Culp stated:

> The Air Force cannot afford to overtrain it's maintenance officers; however, on the other hand, inadequately trained officers cannot perform properly in the maintenance system....The technical aspects of a maintenance officer's duties will vary greatly from assignment to assignment....The variety is endless, and this presents a problem in determining what the proper technical education should be. It is necessary that the technical education be broad enough to prepare the officer for this variety of assignment possibilities. Also, it must be thorough so that each individual maintenance officer is knowledgeable enough to perform properly in all these positions [17:22].

Major Culp conceded that determining the optimal amount of managerial training would be equally as difficult, but his effort to define a conceptual structure for training program content certainly deserves note.

Lieutenant Colonel Howard P. Kenney (1971)

In his AFIT thesis, "A Narrative Guide for Career Planning Decisions of Maintenance Officers in the USAF," Lieutenant Colonel Kenney (38) observed:

> There is no document presently available in the USAF for use in career counseling and career planning which adequately describes the maintenance officer duties at different levels of assignment [38:1].

In advocating the need for such a document, Lieutenant Colonel Kenney renounced AFR 36-23, "Officer Career Development," and AFM 36-1 because neither was sufficiently specific, useful, or relevant. Instead, he prescribed a narrative guide designed to present specific information about the types of duties performed by AMOs at different levels of assignment in each major command (MAJCOM). Lieutenant Colonel Kenney's thesis, then, represents an early identification of deficiencies in career information.

Major Paul Cwiklik (1975)

> The United States Air Force....continues to experience an impairing shortage of qualified field grade maintenance management officers. Most conspicuous are the personnel policies pursued....since they tend to militate against the development of careerists in maintenance. One such policy is the assignment of lieutenant colonels and colonels as chiefs of maintenance who have little or no maintenance experience. This practice is counterproductive to achieving a stable career progression of aircraft maintenance officers up through and including the chief of maintenance assignment [18:2].

With that opening statement, Major Cwiklik's (18) ACSC study indicted personnel policies, both written and unwritten, which he considered career-stifling. Continuing, he detailed the key role of the chief of maintenance position to the maintenance effort and developed the implications of failure in such a position. Recognizing and accepting that such policies would probably continue, however, Major Cwiklik commented:

> Accepting less than a perfect personnel assignment system as a continuing reality, there is a strong need now for a specifically designed maintenance management training program which will help these relatively inexperienced officers make a smoother transition in a new and challenging environment [18:2].

Interestingly, the curriculum developed by Major Cwiklik centered totally on management of resources and contained no technical orientation at all. However, the significance of Major Cwiklik's study to us is not necessarily the curriculum he developed for the program he recommended, but rather the fact that the program itself was recommended. Indeed, in developing his arguments, he considered all of the available courses "insufficient and inappropriate" to the special needs

of the new chief of maintenance. Thus, Major Cwiklik's study touched on the inadequacies of both training and career development, while at the same time, it highlighted the critical and unique nature of a key position.

Major David N. Busby (1976)

After the DCM, the next most responsible position in a maintenance complex is the Maintenance Control Officer (MCO). Major Busby (11), in an ACSC research report entitled "Evaluation of Aircraft Maintenance Control Officer Position Requirements, Assigned Strengths, and Training," noted that the MCO "is placed in a most demanding position and must possess a large reservoir of experience and leadership qualities to successfully accomplish the job [11:13]." The MCO is at once responsible for daily production efforts, sortie generation, scheduling of resources, short-term and long-range planning, work priorities, maintenance/supply interactions, vehicles, non-tactical radios, emergency/war order planning, the Maintenance Management Information and Control System (MMICS), and much more.

Major Busby's concerns were a lack of specific, formal training and the question of promotion eligibility. Although he made no comments on training other than to suggest the need, he did emphasize an apparently conscious effort to fill the MCO position with fully-qualified and experienced maintenance officers. Promotion eligibility out of the MCO position was very difficult to measure. However,

his research revealed that promotions to lieutenant colonel and colonel were slightly fewer than for MCO's contemporaries in other maintenance jobs. He attributed this to promotion board members' lack of familiarity with the extensive responsibilities associated with the MCO position.

Major Albert R. L. Schmidt (1977)

Major Schmidt's (74) ACSC research study sought to determine if there was any relationship between an officer's prior record and his performance as a maintenance squadron commander, and if so, whether a standard could be developed for the maintenance squadron commander selection process. He examined six variables, including amount of prior maintenance experience, grade, aeronautical rating, academic education, and professional military education (PME). He used Maintenance Standardization and Evaluation Team (MSET) inspection results as the measure of success.

Major Schmidt's contention was that prior maintenance experience was an important factor in the success of maintenance squadron commanders, and he offered AFR 36-23 to substantiate his position:

> Designated Career Positions such as maintenance squadron commander are considered to be so important to the effectiveness of aircraft maintenance functions as to require highly trained and experienced career maintenance officers. These positions provide for full utilization of the professional aircraft maintenance officer and should not be filled by officers on career broadening assignments from other specialities. It is preferable to have a qualified career maintenance officer of less rank to fill a designated career position than an officer with the authorized rank who is on a broadening assignment [74:12].

His review of the 1976 SAC MSET inspection results, however, revealed that in practice, experience was often not considered as a primary selection factor. Of 96 SAC maintenance squadron commanders, 72 percent were rated and 41 per cent had less than 18 months experience. Moreover, his study yielded several other interesting insights:

> 1. Majors were more successful than [lieutenant colonels].
> 2. Experienced officers had better results than inexperienced ones.
> 3. Aeronautical rating....was of no major consequence in improving the chances for improved MSET rating.
> 4. Officers with academic education (master's degree) and PME did slightly better than officers without....[74:28].

Using chi-square validation methods, Major Schmidt tested his findings at a 90 percent confidence level and concluded that prior experience and PME were both statistically significant in their relationship to success. Thus his study reinforced the philosophy of AFR 36-23 and provided more evidence that professional AMO development was both necessary and desirable.

Major Douglas D. Stormo (1980)

In an ACSC research paper, "Maintenance Officer Technical Training--A Time for Change," Major Stormo (79) asserted that two historical events accounted for the majority of training problems. First, an imbalance toward junior officers (449% manned in lieutenants in 1980, according to Major Stormo) thrust them into jobs normally occupied by more experienced and seasoned officers:

> Accession levels are on the rise at a time when eager but inexperienced officers are expected to sign-in and immediately assume responsible and complex jobs. This rising proportion of new officers is occurring at a time when experienced maintenance officers are seeking new career fields. One half of the AF Form 90 Career Objective Statements received at the Military Personnel Center request retraining or career broadening out of the aircraft maintenance career field. These statistics support the need to improve initial technical training to assure that new maintenance officers are adequately prepared for their initial jobs [79:9-10].

Second, the existence of dual maintenance management concepts (centralized and decentralized, as previously described in Chapter I) required AMOC to produce an AMO equally capable of assuming responsibilities in either type of organization. Major Stormo's principal reservation dealt with the subtle differences in training required to effectively achieve such flexible credentials.

Finally, Major Stormo stressed the formidable, yet necessary task of training by quoting from the November 1978 USAF Training Symposium:

> The importance of maintenance training in the Air Force is apparent to even the most casual observer of the mission essentiality of maintenance, the complexity of systems maintained, and the sheer quantity of personnel involved....Acquisition of new weapon systems and personnel rotation from one system, or command, to another have training implications for the entire force. Thus, the maintenance training requirement is constant, extensive, and absolutely essential to Air Force mission accomplishment [79:15].

Captains Edward D. Mayfield and Robert W. Walter (1980)

Captains Mayfield and Walter (50), in their AFIT thesis on the "Relationship Between the Initial Duty Assignment and Successive Assignments in the Aircraft Maintenance

Officer Career Field (AFSC 4024)," tried to determine whether a trend toward MAJCOM stagnation existed, and if so, whether that trend was statistically significant. Three answers became evident. First, as the number of assignments within a career increased, there was "a general decrease in the number of....[reassignments] to the MAJCOM of initial duty," indicating that an undefined negative correlation indeed existed. Second, this trend was definite and distinguishable from an otherwise random correlation. Finally, the trend paralleled that associated with the pilot career field, which is almost totally MAJCOM-dependent.

The authors viewed the significance of such a trend in light of its effects on career development. For example, they quoted AFR 36-23, which stated:

> Although separate career development efforts of all echelons are encouraged, they must function within the overall management system to insure cohesive personnel actions....Management must provide guidance and opportunities for career development and create a climate that engenders growth [50:10].

Captains Mayfield and Walter interpreted these passages as explicit Air Force recognition and endorsement of command-unique training based on command-unique missions. They felt that the extensive efforts of the MAJCOMs to train and develop junior AMOs who could be effective within a particular MAJCOM environment led to their hypothesized trend. They pointed out, however, that such supplementary training, however legitimate, should not and must not label individuals receiving it with an indelible command identity. Rather, it

should serve to accommodate and promote the objectives of the Air Force career management program:

> 1. To develop officer qualifications to meet Air Force needs.
> 2. To provide the training and rotation of job assignments to develop officer capabilities.
> 3. To ensure all officers have the opportunity to compete for positions which satisfy their career needs.
> 4. To ensure adequate information is available to allow each individual to plan his career [50:5-6].

Thus Captains Mayfield and Walter identified the parochial nature of MAJCOM career development programs and assignment policies, and offered support for the wider systems viewpoint incorporated in AFR 36-23.

Captains Joanne M. Flanigan and Laurence J. R. Little (1980)

Captains Flanigan and Little (25) developed "A Model of Aircraft Maintenance Officer Turnover" as their AFIT thesis during a period when the effects of turnover were becoming critical in the AMO career field. As they worked to identify those factors which led to the increased turnover, they commented:

> The growing technological complexity of weapon systems and support equipment has placed a premium on highly trained, skilled, and experienced maintenance technicians and managers. The loss of these people has a direct negative impact on Air Force readiness, manifesting itself in high aircraft down time and cost of repair....The complex and critical nature of the aircraft maintenance field demands an experienced and dedicated officer force. And yet, turnover is as much a problem here as elsewhere [25:2].

Using a survey sent out to company grade AMOs, Flanigan and Little analyzed two types of turnover: cross-training into another AFSC and complete separation from the

Air Force. Survey results showed that job satisfaction was related to turnover in both instances, with job interest contributing the most to job satisfaction. Therefore, to decrease turnover, one must increase job satisfaction, a composite factor of which is job interest. Job interest, they contended, could in turn be raised through training and development.

USAF Occupational Measurement Center (1980)

In 1979, the USAF Occupational Measurement Center (OMC) conducted an Air Force-wide survey (61) of AMOs

> ....to assess the jobs and tasks performed by Aircraft Maintenance and Munitions officers and to provide an objective description of the personnel resource which [would] aid in a variety of management decisions affecting such areas as recruiting, classification, training, and career planning [62:1].

The survey sample was composed of 2,346 respondents, 1,981 of whom held an AMO AFSC. The occupational data collected was used to develop job tasks inventories, demographic profiles, organizational comparisons, and an analysis of training emphasis. The OMC published the results in 1980 as an Occupational Survey Report (62). Because of the length and detail of the report, it is inappropriate to list all of the results here. Rather, we wish only to introduce the report and its roots, for we will draw selected results from it as necessary throughout the course of ensuing discussions.

Conclusion

As the previous studies have shown, problems in AMO

training and career development are pervasive and apparently persistent. Every AMO is subject to the effects of these identified difficulties, from the entry-level second lieutenant to the DCM, and a detrimental impact on retention, job satisfaction, career plans, and ultimately mission accomplishment, if not easily measurable, is logically inevitable.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Introduction

It is a capital mistake to theorize before one has the data.

-- Sherlock Holmes,
Sir Arthur Conan Doyle

This chapter details the design and methodology of our research endeavor. Specifically, it addresses the data collection plans we used, the statistical tests we designed and applied, and the assumptions and limitations we faced in striving to realize our research objectives.

Data Collection Plan

To achieve the research objectives set forth in Chapter I, we needed evidence in two areas. First, we desired to know how AMOs perceived the utility and relevance of the training they had received through the basic AMOC, and how they viewed both the career development process and its associated opportunities. Second, we needed to know what efforts were underway or programmed in these same areas, and the perspectives from which these efforts had been initiated or planned. To gather such evidence, we first needed to define the populations of interest and the methods by which data could be obtained.

Defining the Population

We began by defining two populations of interest:

1. All officers on active duty with the USAF in the grades first lieutenant through colonel holding either a primary AFSC or a duty AFSC of 4021, 4024, 4011, 4016, 4091, or 4096.

2. All staff maintenance managers at Air Staff, MAJCOMs, AFMPC, and AMOC.

We then selected a sampling technique for each defined population. Within the first population, we were interested in two subpopulations: DCMs and non-DCMs. Within the non-DCM subpopulation, we were further interested in obtaining a sample of grades proportional to the grade strength statistics in published population reports (1). A systematic stratified random sampling plan (78:80), in which the population is divided into the required number of mutually exclusive subpopulations (strata), best suited our needs. Therefore, we employed that method to divide the first population into the desired duty categories and to segment the non-DCM subpopulation into the desired grade levels.

For the second population, we were interested in obtaining a sample representative of the agencies and individuals playing key roles in formulating and implementing policies and programs aimed at the training and career development of AMOs. The plan best suited here, given time and budget constraints, was purposive convenience sampling (78:81), a non-random method of "hand-picking" elements for inclusion in a study based on a highly subjective assessment of the relevance of those elements to the study's objectives.

We now had to determine the sizes of the samples required to allow statistical inferences at our desired level of confidence.

Developing the Sampling Plan

After receiving approval of our survey instrument and permission to administer it from the Research and Measurement Division of AFMPC, we were ready to draw our samples. In April of 1982, we obtained a computer listing designed to provide the name, military address, and duty title of all Air Force personnel meeting both of the following specifications:

1. An active duty officer in the grade first lieutenant, captain, major, lieutenant colonel, or colonel.

2. A duty AFSC or primary AFSC of 40XX (meaning an aircraft or munitions maintenance officer).

We then deleted from this list all individuals holding both a duty AFSC and a primary AFSC of 405X (meaning a munitions maintenance officer), or not presently working in a job related to aircraft maintenance, such as a general's aide or a Reserve Officer Training Corps (ROTC) professor of aerospace studies. We did not, however, delete personnel on a temporary absence from aircraft maintenance, such as students at SOS or ACSC.

After these deletions, we were left with the population to be sampled. Based on telephone conversations with officials at AFMPC (46; 72), we assumed the population count

to be 3,308 and developed our sampling strategy accordingly. Dividing the list into two categories, DCM and non-DCM, resulted in a DCM subpopulation of 122, leaving an assumed non-DCM subpopulation of 3,186. Using these population parameters in the expression

$$d = Z\sqrt{\left(\frac{N - n}{N - 1}\right)\left(\frac{P(1 - P)}{n}\right)}$$

where Z equals one half of the standard deviation associated with the desired level of confidence (α), N equals the size of the finite population being sampled, n equals the sample size required, P equals the proportion of the population in a given category (normally assumed to be .5), and d equals the acceptable percentage error about the population value (5:22; 42:78; 76:188-191),

and solving for n based on a confidence level of 95 percent and a percentage error of plus or minus 5 percent, the formula yielded required sample sizes of 343 non-DCMs and 93 DCMs. Calculation of a sample size for the senior maintenance manager population was not attempted, as it would have been meaningless in light of the non-random nature of our selection process.

Having defined our populations of interest and the required sample sizes, we next focused on the data gathering instruments we would use. We elected to distribute a survey instrument to the first population, and to conduct personal interviews for the second.

The Survey Questionnaire

One of the data collection methods we used was an 89 data point questionnaire with optional, open-ended questions at the end[3]. Questions relating to perceptions of the utility of the AMOC curriculum and to career development issues were constructed using a seven-point Likert interval data scale, while questions pertaining to recommended changes in the AMOC curriculum were based on a three-point interval data scale. All scales are shown in Figure 4.

Demographic questions were generally adopted directly from a job inventory questionnaire compiled by the USAF Occupational Measurement Center (OMC) at Randolph AFB, Texas (61). Questions on attitude and perception were tailored after similar questions incorporated in the Organizational Assessment Package compiled and administered by the Leadership and Management Development Center (LMDC), Air University, Maxwell AFB, Alabama (44). Both sources are used extensively by the Air Force as references for numerous other questionnaires. Thus, while the validity and reliability of our survey instrument has not been established, it may be inferred from the parent documentation.

Our survey was divided into five areas. Questions 1 through 25 provided a demographic profile of the respondents. Question 26, composed of 26 subquestions, assessed AMOs' perceptions of the relevance and utility of the AMOC curriculum. Question 27, also divided into 26 subquestions, addressed the

[3]The complete survey instrument has been included as Appendix A.

7---------6---------5---------4---------3---------2---------1

Very Useful — Neither Useful Nor Useless — Very Useless

(+)--------(=)--------(-)

More Emphasis — No Change — Less Emphasis

7---------6---------5---------4---------3---------2---------1

Strongly Agree — Neither Agree Nor Disagree — Strongly Disagree

FIGURE 4.

Response Scales Used in Survey Instrument (78:62-63)

issue of changing the AMOC curriculum and the direction such changes should take. Question 28, divided into 6 subquestions, measured attitudes concerning AMOC course content. Question 29, divided into 16 subquestions, collected attitudinal and perceptual data on career development, career progression, and training. Finally, questions 30 through 33 were open-ended and provided an option to write in comments concerning career development, assignments, training, and the manager/technician controversy.

Interviews of Senior Maintenance Managers

To complement the results of our survey, our second data collection method involved interviews with senior maintenance managers at Air Staff, MAJCOMs, AFMPC, and AMOC. Managers at these levels develop, implement, and administer the policies and programs leading to training and career development for the AMO. They provide the systems perspective, the long-range viewpoints not necessarily available through survey techniques, and hopefully the answers to where we are now and where we hope to be in the future.

To maintain a degree of standardization among our interviews, we asked the same questions of each individual[4]. These questions addressed the quality of the AMOC curriculum as reflected in the performance of assigned AMOs, specific MAJCOM programs to continue and/or supplement AMOC training,

[4]A complete list of the standard questions used in each interview has been included as Appendix B.

the manager/technician controversy, the need for intermediate and advanced maintenance management training, current problems, future challenges, and other management concerns.

Statistical Test Designs

As the survey instruments were returned by the respondents, we encoded their answers and comments, and entered them into the data base[5]. If our entire AMO population were included in the data base, our results would be precise. However, since we were using sampling techniques, we had to specify a confidence level, developed through tests of statistical significance, which identified the probability of our inferred results occurring through chance. In all cases, we elected to use an alpha of .05 as significant, which meant that the probability of occurrence due to chance was only 5 out of 100. Thus, our confidence level was 95 percent for all tests.

The following sections describe the statistical computation systems used and the specific tests applied. Persons unfamiliar with these tests are referred to any basic statistics text for a complete explanation of the described procedures.

Statistical Package for the Social Sciences

The Statistical Package for the Social Sciences (SPSS)

[5]The codes used to translate the responses into machine compatible data are listed and explained in Appendix C. The complete data base is included in Appendix D.

is a packaged system of computer programs designed for the statistical analysis of data. It performs many different types of data analysis simply and conveniently, including descriptive statistics, frequency distributions, crosstabulations, linear regression and correlation, analysis of variance, and many more increasingly complex techniques (60).

Descriptive Statistics and Frequency Distributions

FREQUENCIES is an SPSS program which presents one-way frequency distribution tables for discrete variables. By selecting the appropriate options, desired statistics may be included on the SPSS output product. We elected to include the mean, median, mode, minimum value, maximum value, and range of the responses to each question.

Crosstabulation

CROSSTABS is an SPSS crosstabulation program which develops two-way to n-way contingency tables. These tables are joint frequency distributions of the cases comprising the data base. The statistical significance of these relative frequencies and the strength of the relationships can be provided by the SPSS output. These "measures of association" show how strongly two or more variables are related to one another and the extent to which prior knowledge of one variable will predict the value of another variable.

The test associated with contingency tables uses the chi-square statistic to determine significance and to test the hypotheses

H_o: The respondents' answers for a given question are independent of the demographic factor being tested, versus

H_a: Answers and demographic factor are dependent.

The chi-square statistic is determined by the expression

$$\text{Chi-square} = \frac{(O_i - E_i)^2}{E_i}$$

where O_i equals the observed frequency in each cell of the table, and E_i equals the expected frequency in each cell calculated as

$$E_i = \frac{c_i r_i}{N}$$

where c_i is the frequency in a respective column total, r_i is the frequency in a respective row total, and N is the total number of valid cases (60:223-224). The larger the chi-square value is, the greater the probability that the results are significantly different from the normally expected values. SPSS calculates both the chi-square statistic and the level of significance, or alpha (α) value, associated with a particular table. Significance levels of .05 or less indicate that a statistically significant relationship exists, and that the null hypothesis, H_o, may be rejected.

Linear Regression and Analysis of Variance

BREAKDOWN represents a variation on the SPSS program

CROSSTABS. In this form, however, selection of the optional statistics will provide a test of linearity and/or a one-way analysis of variance (ANOVA). Thus, BREAKDOWN represents a convenient way of performing three statistical tests simultaneously with only one program coding.

The test of linearity is essentially a bivariate correlation analysis, or simple linear regression, which is based on two variables, one dependent and one independent. It is mathematically defined by the expression

$$y = B_o + B_1 x + e$$

where y equals the dependent variable, x equals the independent variable, B_o equals the Y-intercept of the linear regression line on a Cartesian plane, B_1 equals the slope of the linear regression line, and e equals the random error component (52:292-329). The simple regression, or least-squares, line represents the straight line which predicts the correlation so as to minimize the collective deviation of the data points from that line. The Pearson product-moment correlation coefficient, symbolized by r, provides the measure of the linear "goodness-of-fit." The correlation coefficient is calculated by the expression

$$r = \frac{SS_{xy}}{\sqrt{SS_{xx}SS_{yy}}}$$

where

$$SS_{xy} = \sum x_i y_i - \frac{(\sum x_i)(\sum y_i)}{n}$$

$$SS_{xx} = \sum x_i^2 - \frac{(\sum x_i)^2}{n}$$

$$SS_{yy} = \sum y_i^2 - \frac{(\sum y_i)^2}{n}$$

where x_i equals the independent variable i, y_i equals the dependent variable i, and n equals the total number of data point sets (52:292-329).

The correlation coefficient r ranges in value from -1.0 to +1.0. As r approaches -1.0 or +1.0, the linear relationship becomes stronger and the two variables in question become more closely related. Conversely, as r approaches 0.0, the two variables become less related and more independent of one another.

We chose to use a reported absolute r value of 0.6 or greater as significant. Since we wished to test the hypotheses

H_o: The respondents' answers for a given question are not linearly related to the demographic factor so being tested, versus

H_a: Answers and demographic factor are linearly related,

absolute r values of 0.6 or greater would cause us to reject the null hypothesis.

The one-way ANOVA (52:456-481), also know as the completely randomized design, makes use of independent random samples to compare more than two population means. It compares the variation among the sample means measured by a weighted sum of the squares of the deviations about the overall mean. This is called the sum of squares for treatments (SST) and is given by the expression

$$SST = \sum n_i \left(\bar{x}_i - \bar{\bar{x}}\right)^2$$

where n_i equals the size of sample i, $\bar{x}_i$ equals the mean of sample i, and $\bar{\bar{x}}$ equals the mean of all i samples (52:456-481).

Thus as the difference between each sample mean and the overall mean increases, SST increases, indicating that the sample means are different. The SST is then compared to the sum of the squared errors (SSE), which measures the pooled within-sample variability given by the expression

$$SSE = \sum \sum \left(x_{ki} - x_k\right)^2$$

where x_{ki} equals the ith measurement in sample k, and x_k equals the mean of sample k (52:456-481).

Thus as the differences within a sample increase, SSE increases, indicating that the variability is unexplained by differences between the sample means.

The next step compares the variability between sample means (SST) to the pooled variability within samples (SSE).

First, the mean square for treatments (MST) is calculated using the expression

$$MST = \frac{SST}{k - 1}$$

where k equals the number of samples.

Next, the mean square for error (MSE) is calculated using expression

$$MSE = \frac{SSE}{n - k}$$

where n equals the total number of measurements and k equals the number of samples.

Comparing the ratio of MST to MSE yields a measure of statistical significance called an F statistic, given by the expression

$$F = \frac{MST}{MSE}$$

The F statistic is then used to test the hypotheses

H_o: The response means formed by varying levels of the demographic factor under test are equal, versus

H_a: Answers and demographic factor are related.

Large values of the F statistic indicate that the differences between sample means are large, and tend to cause us to reject the null hypothesis. Once again, we elected a significance level of .05, yielding a 95 percent confidence level.

Kolmogorov-Smirnov Test

NPAR TESTS is a series of SPSS nonparametric

statistical programs which minimize assumptions concerning the underlying structure of sample data. Included in this package of programs is a versatile statistical program to determine "goodness-of-fit" based on method developed by Kolmogorov and Smirnov in 1939.

The Kolmogorov-Smirnov (K-S) test is widely used to determine the extent of agreement between the distribution of a set of sample data and some specified theoretical distribution. It is conducted by developing or specifying the cumulative probability distribution that would result from the theoretical distribution and comparing it to the cumulative probability distribution of the sample data. A test statistic is derived as the largest absolute difference between the theoretical and observed cumulative distributions. The test statistic is then compared to a critical value, which is based on a stated level of statistical significance. Continuing our convention of specifying a significance level of .05, the critical value is calculated from the expression

$$D = \frac{1.36}{\sqrt{n}}$$

where D equals the critical value and n equals the sample size (76:380).

If the test statistic exceeds the critical value, then a hypothesis of similar distribution is rejected, and we may conclude that the observed distribution differs from the theoretical distribution.

Content Analysis

The open-ended questions generated diverse, unstructured responses which we examined through content analysis. This is a technique for studying communications by classifying comments into various categories and annotating the frequencies with which each classification is found. Flanigan and Little (25) employed this same technique to analyze their survey results and provide source documentation.

Assumptions and Limitations

In any research endeavor, there are inherent assumptions and limitations which must be recognized. Our research assumptions started with the sample selection process and progressed through the data analysis of our results.

We made several assumptions in administering our survey. The first deals with the sample selection process, since we drew our sample from a computer listing which we assumed to be complete and current. Second, initial data accuracy and ensuing inferences relied on what we believed to be honest and independent answers from each of the individual respondents. This belief goes hand-in-hand with the assumption that the respondents marked the correct or intended answer alternative(s).

As several of our assumptions were born of the statistical tests we chose, so some resulted from the SPSS package itself. Since our survey analysis relied so heavily on the accuracy of the programs we used to examine the data

base, we had to assume the internal vaidity of these programs and their reported results. When using the ANOVA program option, we assumed the normality of the populations from which the samples were drawn. Likewise, simple linear regression involves four assumptions natural to the process itself. First, the mean of the error over a long series of experiments should be zero. Second, the variance of the probability distribution of the error should be constant. Third, the probability distribution of the error should be normal. Fourth, the probability associated with two completely different observations should be independent.

We have already discussed many of the limitations of our study in the methodology section, but to assure an understanding of these limitations, we will summarize them. We intentionally deleted second lieutenants, munitions officers, and AMOs not working in maintenance-related jobs. Second lieutenants were eliminated because we felt their inexperience would not allow them to comment authoritatively on problems with the career field. Munitions officers were excluded because they would have represented more of a research workload than we could have realistically expected to complete. Personnel not currently working within the AMO AFSC were omitted due to uncertainty about their currency in the career field.

Military distribution and overseas mail represented more of a limitation than we had expected. Approximately six weeks after survey mailing, we stopped incorporating

returned surveys into the data bank to permit time for the required analysis. Surveys returned after that date were not included, but were opened and examined. These late receipts revealed that a significant number of overseas responses took longer to complete the postal circuit than we had anticipated. Thus, our overseas commands were probably not as well represented as they might have been.

The number of DCMs responding to our survey was also low, driving our confidence level for that subpopulation from 95 percent to 87 percent and thereby limiting our ability to generalize attributes from our sample to the population.

The next limitation was self-imposed. During the survey drafting and approval process, we eliminated several questions from our original questionnaire. We did this for two reasons. First, long surveys were apparently less likely to be approved because of the impact on field units. Second, survey recipients have been prone to simply discard or ignore a longer document requiring hours of work. Most of the questions we deleted were those designed to cross-check responses to other questions and thus provide some internal validation.

The final limitations we had to consider were time and budget. The thesis itself had to be completed by 2 September 1982, thereby limiting the time we could use to research and gather data. Had budget limitations been less constraining, we might have conducted personal interviews at overseas locations, operational bases, and ancillary agencies.

CHAPTER IV

RESULTS

Introduction

Never, never doubt what nobody is sure about.

-- Willie Wonka

How often have I said to you that when you have eliminated the impossible, whatever remains, however improbable, must be the truth.

-- Sherlock Holmes,
Sir Arthur Conan Doyle

This chapter describes the results of the research we conducted. It details the administration and receipt of the surveys, reports the results of our statistical tests, and provides synopses of our interviews.

Administering the Survey

After defining our populations, selecting our sampling plans, and devising our statistical tests, we turned our attention to administering the survey and began with the DCM subpopulation. Since the DCM category contained only 122 names and we required 93 respondents to meet our desired level of statistical significance, we elected to send surveys to all of the individuals on the list.

In the non-DCM category, however, we applied a random selection method to our stratified listing. Starting at an arbitrary point, we chose every fifth name on the list, resulting in a total of 850 names, or something over two

times the amount required for our level of statistical significance. We felt this large number would insure the return of the 343 surveys we needed to maintain the integrity of any statistical inferences. Indeed, the historical return rate of 50 percent for AFIT-sponsored surveys seemed to dictate it.

Surveys were mailed to both groups at the end of April. As the completed surveys came back, we immediately updated our steadily growing data base. We decided to discontinue such updates when we reached or exceeded the 93 DCM and 343 non-DCM respondents required, or at the end of May if we had already realized those numbers. Of the 972 surveys mailed, 43 were returned as undeliverable, 38 of them in the non-DCM category. By the end of May, we had received 550 responses, 470 of which were from non-DCMs. Thus, the adjusted return rates were 57.9 percent for the non-DCMs, 68.4 percent for the DCMs, and 59.2 percent overall. Unfortunately, we never received a sufficient number of DCM responses to permit using our desired level of confidence. However, we recomputed the formula for sample size by inserting the number of responses received as n, then we solved the equation for Z. Thus, we can report our results for the DCM subpopulation with at least an 87 percent level of confidence. Our next task was to apply our statistical tests to the encoded responses in our data base.

Survey Results

Demographic Results

Using SPSS program FREQUENCIES and the appropriate statistical computation options, we obtained descriptive statistics for the two subpopulations[6].

The median non-DCM respondent was a mature, experienced male captain, 31 to 35 years old, with 8 to 10 years commissioned service. He may be generally described as very well educated, since 98.1 percent of the respondents possessed a bachelor's degree and 46.0 percent held a master's degree. His bachelor's degree was most commonly related to business. His technical education and training had been gained through AMOC's basic course and had been supplemented by a Field Training Detachment (FTD). Furthermore, since 68.9 percent of the respondents had completed SOS and 44.7 percent had completed ACSC, his professional military education (PME) was typically solid. His common work environment was almost universally with an operational aircraft maintenance unit in Strategic Air Command (SAC), Air Training Command (ATC), Military Airlift Command (MAC), or with the Tactical Air Command (TAC) or another member of the tactical air forces (TAF). He was generally a career AMO in an AFM 66-1 maintenance organization and had no enlisted experience. Thus our median non-DCM respondent compared extremely well

[6]A complete accounting of the descriptive statistics for each subpopulation is included as Appendix E.

with the median AMO described by AFMPC and by the OMC (1; 61), and we considered the non-DCM demographic data base representative of the AMO population.

The median DCM respondent was a male colonel, 46 to 50 years old, with over 20 years commissioned service. He may be described as a seasoned, professional officer, with a formal educational background slightly more advanced than the non-DCM. His technical education and training were more difficult to assess, however, due to the variety in his background. Although 32.5 percent of the DCMs attended AMOC's basic course, the AMOC accelerated course accounted for another 30.0 percent of the respondents. This condensed curriculum, designed specifically for rated officers, now lasts four weeks and is completely oriented to maintenance management subjects. Another 7.5 percent had received avionics maintenance officer training at Lowry AFB, Colorado, but that course is no longer open. It has been incorporated into the AMOC curriculum and the previous avionics officer AFSC has been absorbed by the AMO AFSC. Finally, 6.3 percent of the respondents had attended the Munitions Maintenance Officer Course, AMOC's sister school. The munitions and AMO AFSCs combine at the Maintenance Staff Officer (AFSC 401X) level to form a single channel for subsequent career progression. FTD, normally the only supplemental technical education available, had been attended by 32.4 percent of the DCMs. Last, but certainly not least, the median DCM was broadly educated in his profession, having

completed SOS (82.5 percent), ACSC (80.0), Industrial College of the Armed Forces (58.8 percent), and Air War College (21.8 percent).

The DCM's environment was normally an operational wing in SAC, MAC, or the TAF. He was often a rated officer, as 48.8 percent were either broadening into maintenance or serving as a member of the rated supplement. While career AMOs comprised another 41.3 percent, many of these were at less than wing level. This high proportion of rated officers tended to depress the experience level, since the median equaled that of the non-DCM group, much lower than we would have expected. As we had no statistical portrait of the DCM to which we could compare our sample, we could not establish that the DCM sample demographics reliably represented the DCM subpopulation.

Response Results--An Introduction

Before we discuss the responses to the individual questions, a short review is in order to aid the reader in focusing on our question arrangement within the survey[7].

First, questions 26 and 27 were composed of 26 subquestions, with each subquestion corresponding to a different portion of the AMOC curriculum. In question 26, each subquestion employed a separate seven-point Likert scale designed to quantify individual AMO perceptions. Using

[7]The original survey instrument and descriptive statistics of the response results are included as Appendices A and F.

those scales, AMOs were asked to rate the utility of each specified section of the curriculum to their present job. In question 27, each subquestion employed a three-point scale. AMOs were asked to recommend whether or not the emphasis in that area should change, and if so, whether it should increase or decrease.

Questions 28 and 29 were composed of 6 and 16 subquestions respectively. Each subquestion employed a seven-point Likert scale. The set of 6 subquestions, relating exclusively to AMOC, asked AMOs to express their opinions and attitudes regarding AMOC as a whole. The set of 16 subquestions asked for AMOs' perceptions on issues such as career development opportunities, assignments, the manager/technician debate, and AFMPC career management. Finally, questions 30 through 33 were open-ended, allowing each respondent an opportunity to include free-form answers to a variety of career topics.

We structured the questionnaire so that each respondent could reply directly on the survey form. We felt this simplification would prompt more individuals to complete the survey and return it. Furthermore, we designed the survey so that those who had not attended the basic AMOC did not answer questions relating to it.

In the discussions of questions 26, 27, and 28, we did not include any results for the DCM subpopulation. Since such results would be based only on the 26 DCM respondents who had attended the basic AMOC, we did not feel such a

small sample would support any generalizations. Finally, throughout our report on the results, all mean values represent the means of the encoded responses as measured against the appropriate rating scale.

The Utility and Relevance of the AMOC Curriculum

The first 10 subquestions of question 26, corresponding to the technically-oriented segments of AMOC instruction, were scored primarily in the "useful" ranges. The only exceptions were in the segments for fundamental electricity, fundamental electronics, and weight and balance, all of which scored just under the central scale value of 4.0 and slightly into the "useless" ranges. However, the average of all 10 means yielded a rating of 4.44, indicating that respondents found the technical blocks slightly useful overall. The first 10 subquestions of question 27, corresponding to the same areas as in question 26, yielded similar results. The same segments were judged as requiring more emphasis, while the same three exceptions were recommended for less. Thus, the two blocks of subquestions corroborated one another.

The remaining 16 subquestions, corresponding to the managerially-oriented segments in the AMOC curriculum, were all scored in the "useful" ranges for question 26. The average of all 16 means equaled 5.13, revealing that respondents found the managerial subjects useful overall. The 16 subquestions of question 27, corresponding to the same areas as in question 26, once again yielded parallel results.

Without exception, all areas were deemed to require increased emphasis. Thus these two blocks of subquestions also substantiated one another.

Topical Perception Results

In this section, we discuss the results of questions addressing a variety of contemporary issues. The organization of this section is therefore topical rather than sequential. While each question is discussed individually, this discussion also incorporates results from all question relating to the area under review.

Question 28A: AMOC does a satisfactory job in preparing entry-level aircraft maintenance officers.

Question 28B: AMOC teaches too much theory.

Question 28C: AMOC training has little relevance beyond the first few assignments.

Question 28D: Personnel scheduled to attend AMOC should first be sent directly to their unit/command of assignment to gain some practical experience and perspective.

Questions 28A through 28D returned means of 4.08, 4.22, 4.29 and 4.29 respectively, all of which are slightly into the "agree" ranges. Thus while AMOC graduates consider their preparation satisfactory, they feel it is too theoretical and quickly loses relevance. Lastly, they feel that practical experience at a field unit would have afforded a better perspective on AMOC training.

Question 28E: The course content of AMOC concentrates

too much on the technical aspects of the job, and not enough on developing management skills, such as understanding human behavior and counseling individuals.

Question 28F: The course content of AMOC concentrates too much on the managerial aspects of the job, and not enough on developing technical knowledge to cope with complex modern weapon systems.

Questions 28E and 28F were originally intended to provide a crosscheck of the blocks of responses relating to the AMOC curriculum. They returned respective means of 3.84 and 3.45, thus apparently validating the previous results. However, the inferences we drew from these two questions may easily be argued, and we must concur that our conclusions of independent substantiation may be totally erroneous. The structure of the questions allowed too many interpretations of what the opposite choices might have been. Therefore, while we have chosen to report the results, we cannot offer them in support of any previous findings.

At this point in the survey, the DCM subpopulation was once again fully represented. Therefore, it has been included in all following discussions.

Question 29A: Ideally, an aircraft maintenance officer should be a technician first and a manager second.

Question 29B: A broad base of management skills is more important to an aircraft maintenance officer than a broad base of technical knowledge.

Question 29A was designed to assess the AMO's opinion on the manager/technician controversy, but with the emphasis in favor of the technical side. The DCM mean (2.50) and the

non-DCM mean (2.55) were both well into the "disagree" ranges. Question 29H asked for essentially the same opinion, but with the emphasis shifted in favor of the managerial side. The DCM mean (4.69) and the non-DCM mean (4.85) were again rather close, this time into the "agree" ranges, underscoring the consistency of the responses. While the extent of agreement was not a mirror-image of the extent of disagreement, the questions were not structural opposites. But as we show next, questions 29O and 29P also helped to substantiate the consistency.

> Question 29K: When I am TDY with a unit, I am more of a technician than I am a manager.
>
> Question 29M: Overall, I am satisfied with the degree, depth, and scope of the maintenance training I have received so far.
>
> Question 29O: If I have any weaknesses, they are primarily in technical knowledge.
>
> Question 29P: If I have any weaknesses, they are primarily in managerial skills.

Question 29K was meant to discover whether an AMO who had deployed with an aircraft maintenance unit perceived any differences in role definition. Responses for the DCM mean (2.49) and the non-DCM mean (2.75) were well into the "disagree" ranges. However, as with questions 28E and 28F, we found that with the oppositely-structured question missing, the responses were of little value in corroborating previous findings. We do not, therefore, offer any conclusions to this question. Question 29M was intended to measure the level of

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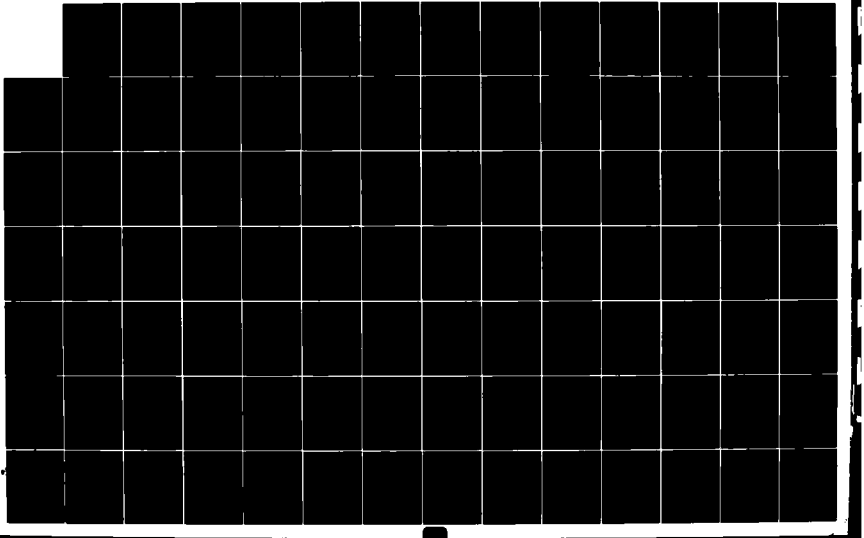
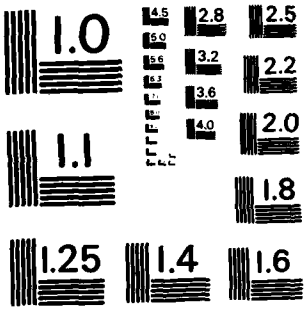




satisfaction with the maintenance training program each individual had experienced. The DCM mean (3.86) and the non-DCM mean (3.93) were once again very close and extended slightly into the "disagree" ranges. This confirms the general tenor of the results from questions 26 and 27, in which the consensus was for increased emphasis in most curriculum areas. Questions 29O and 29P were intentional structural opposites designed both to provide insights into opinions on the manager/technician debate and to measure perceived training needs. For question 29O, the DCM mean (4.66) and the non-DCM mean (4.62) were almost identical and extended significantly into the "agree" ranges. Question 29P, the structural opposite, produced a DCM mean (2.49) and a non-DCM mean (2.75) well into the "disagree" ranges. Again, the DCM and non-DCM both tended toward the same end of the scale. Moreover, the results interestingly showed that while there were perceived weaknesses in technical knowledge, there were also perceived strengths in management skills.

Question 29B: Intermediate and advanced professional maintenance management courses should be available to develop personnel as they progress up the career ladder.

Question 29F: Normal professional military education courses, such as SOS and ACSC, are sufficient alternatives to any proposed intermediate maintenance management courses.

Question 29I: The best way to develop the skills and knowledge necessary for a position of increased responsibility in aircraft maintenance is through the "school of experience."

This series of questions was devised to measure opinions about the AMO's intermediate career training. Question 29B, with a DCM mean (5.93) and a non-DCM mean (5.93) reflecting identical group opinions deeply into the "agree" ranges, demonstrates strong support for intermediate and advanced maintenance management courses as part of a continuing career development process. Question 29F, designed to complement 29B, produced a DCM mean (2.29) and a non-DCM mean (2.41) deeply into the "disagree" ranges of the rating scale, thus supporting the requirement for continued professional development through unique schools. Finally, question 29I returned a DCM mean (4.90) and a non-DCM mean (5.14) both marginally into the "agree" end of the scale. While this may appear contrary to the opinions expressed in questions 29B and 29F, it may also reflect the feeling that no amount of education can fully prepare an AMO for the demands of the career field.

Question 29C: The AF Form 90 is an efficient and practical means for expressing career objectives to AFMPC.

Question 29G: Individual maintenance officers should frequently discuss career plans and goals with AFMPC by a means other than the AF Form 90.

Question 29J: The aircraft maintenance career managers at AFMPC satisfactorily match an individual's talents to the requirements of a job.

Question 29N: The maintenance career managers at AFMPC adequately monitor and foster an individual's progression and development toward increased career responsibilities.

Career management was the focus of this set of questions. Questions 29C and 29G were designed to measure the perceived usefulness of the AF Form 90, Career Objective Statement, while questions 29J and 29N were meant to gauge the effectiveness of the AFMPC career managers through the perceptions of those they serve. Question 29C, with a DCM mean (4.63) and a non-DCM mean (4.36) into the "agree" ranges, and question 29G, with a DCM mean (5.48) and a non-DCM mean (5.83) well into the "agree" ranges, together indicated that most respondents accepted the AF Form 90 as a useful tool, but chose to supplement it by other means. This was consistent with the results of one of our demographic questions, which asked what other methods the respondents had used to communicate with their career monitors at AFMPC. The non-DCM responses showed that 87.2 percent had supplemented the AF Form 90 by telephone, 42.8 percent by personal interviews at AFMPC, and 16.4 percent by letters and resumes. Only 6.6 percent had used no means other than the AF Form 90. Colonels were not included in these statistics, since they use a different form for career management purposes.

Question 29J, with a DCM mean (3.75) and a non-DCM mean (3.68) into the "disagree" ranges, and question 29N, with a DCM mean (3.79) and a non-DCM mean (3.67) also into the "disagree" ranges, together reflect a mild but consistent dissatisfaction with career management efforts at AFMPC.

Question 29D: The aircraft maintenance career field

offers greater challenges and a wider variety of responsibilities than other Air Force jobs.

Question 29E: I have little perspective on how far I should have progressed in my career pattern at any point in time.

Question 29L: Rated supplement officers in the aircraft maintenance career field receive better job assignments than non-rated personnel.

The balance of question 29 addressed summary opinions and perceptions. Question 29D yielded a DCM mean (6.13) and a non-DCM mean (6.06) overwhelmingly into the "agree" ranges, reflecting an overall pride and satisfaction with the job. Question 29E, with a DCM mean (2.34) and a non-DCM mean (2.81) showing well into the "disagree" ranges, indicated that most AMOs felt they had the information they needed to evaluate their own progress and to develop career plans and goals. Finally, question 29L was included to measure the strength of the conviction that progression to the higher levels of responsibility in aircraft maintenance is easier for the rated officer than for the career professional. This perception, reported and recorded in the Occupational Survey Report (62) of the AMO career field published in 1980, surfaced again with a DCM mean (4.14) and a non-DCM mean (4.98) into the "agree" ranges. While non-DCMs agreed more strongly than DCMs, 49.8 percent of the DCMs were rated officers career broadening into maintenance or serving in the rated supplement, as compared to 11.0 percent of the non-DCMs in those same circumstances.

Statistical Test Results

We applied four statistical tests to our sample data base: chi-square, linear regression, one-way ANOVA, and Kolmogorov-Smirnov (K-S) goodness-of-fit. The particular segments of the data base against which the tests were applied and the results of those tests are reported in the following sections. In every instance, we performed each test against sets of data base responses derived from each of three sources: the DCM subpopulation, the non-DCM subpopulation, and the entire AMO population.

Chi-Square Results for Contingency Tables

Using SPSS program CROSSTABS, we constructed contingency tables for all question variables crosstabulated against all demographic variables. We had hoped to isolate some specific demographic factors which could serve as significant predictors of question responses. Although several significant relationships surfaced for isolated combinations, we were unable to discern a meaningful pattern in any of our chosen sets of responses. Therefore, we could not establish that any particular demographic factor was related to a given set of answers. However, this failure in itself is evidence both of the diverse nature of the respondents and of the universal applicability of the issues.

Linear Regression and ANOVA Results

Using the BREAKDOWN program in SPSS, we selected a

statistical option to apply linear regression techniques to detect and evaluate any correlation between a question variable and a demographic variable. We hoped to discover whether any statistically significant correlations could be shown between responses and demographic factors and if so, the strength of these relationships. Although correlations existed in every case we examined, there were none that yielded a correlation coefficient equaling or exceeding our stipulated minimum.

Another statistical option included in the BREAKDOWN program involves the use of the ANOVA technique to determine if the response means associated with different values of a demographic variable significantly differ from the mean over all ranges. The results were similar to those in the chi-square test, and once again, no meaningful pattern emerged. Thus, we could make no inferences.

Kolmogorov-Smirnov (K-S) Test Results

The final statistical application involved the Kolmogorov-Smirnov (K-S) goodness-of-fit test. Although we adapted our individual question structures from similar questions in reputable measurement devices, the entire survey instrument was developed to meet our unique needs. Since the instrument had not been previously administered and validated, we could not predict the response distribution prompted by any particular question. Thus, we were unable to determine whether the response patterns we elicited were typical for any

given question.

Therefore, we set out to determine if the response patterns in our data base were significantly different from either a theoretically normal distribution pattern or a theoretically uniform distribution pattern. Logic dictated that if the sample response pattern could not be distinguished from a normally-distributed or a uniformly-distributed response pattern, we could not infer the existence of an opinion skewed toward either side of the theoretical mean. However, if the response pattern could not have come from a normal distribution and could not have come from a uniform distribution, it must be skewed one way or the other. Thus, if the opinions or attitudes represented differ from the mean, those opinions or attitudes must be significant in the direction indicated.

Using the Likert scale parameters for the indicated sets of questions, we subjected all question responses to the two K-S tests described:

1. Normal, with a mean of 4.0 and a standard deviation of 1.0, for question 26, 28, and 29.

2. Normal, with a mean of 2.0 and a standard deviation of 0.33, for question 27.

3. Uniform, with a minimum value of 1.0 and a maximum value of 7.0, for questions 26, 28, and 29.

4. Uniform, with a minimum value of 1.0 and a maximum value of 3.0, for question 27.

Test results indicated that all response patterns

differed from both of the theoretical distributions. Therefore, we concluded that all responses were indeed significant.

Open-Ended Questions

In this section, we highlight the open-ended questions which prompted free-form responses to a variety of topics. Respondents seemed very open and very concerned on most of the issues raised. Several took the time to provide answers as long as seven typewritten pages, while others indicated an eagerness to discuss the topics further by telephone. Many even endorsed their comments, and expressed a desire to receive feedback on our results.

Question 30: Assuming that an intermediate maintenance management course were to be developed and offered, please answer the following questions:

A. Should it be mandatory or not, and why?
B. Who should attend it, and when in their career pattern?
C. What topic areas should it cover?

Part A was the only portion of this question encoded into the sample data base. Part B answers were not included because the responses were almost universally in agreement with one another, while part C answers were so totally diverse that they did not lend themselves to encoding.

Part A was encoded using content analysis to evaluate and classify the responses into one of five response categories: mandatory attendance, voluntary attendance, selective attendance, not needed, or undecided. Mandatory attendance was recommended by 64.4 percent of the DCMs and

by 55.0 percent of the non-DCMs. Many respondents explained further that unless the course were mandatory, work pressures and/or DCMs would keep the best from attending. Part B answers, from DCMs and non-DCMs alike, unequivocally specified that senior captains should attend at the six- to ten-year point in the career pattern. Finally, while part C answers were diverse, the vast majority of subjects recommended for inclusion in the curriculum were tied to maintenance management and were usually oriented to a "big-picture" perspective. The only technical subjects mentioned were related to state-of-the-art technology updates.

Question 31: Assume that you are the AFMPC manager for the aircraft maintenance career field, and please answer the following questions:
- A. What things would you consider in selecting an individual for an assignment?
- B. What things would you consider in selecting an assignment for an individual?

Question 32: Due to the shortage of experienced captains and majors in the maintenance career field, more entry-level and relatively inexperienced junior officers have been thrust into positions normally occupied by more experienced and seasoned officers.
- A. How well trained have these officers been to accept such a challenge?
- B. To what extent, if any, has your unit's effectiveness been impaired by this situation?

Question 31 yielded such diverse responses that no generalizations were possible, except perhaps that the diversity of opinion itself highlights the difficulties facing AFMPC career managers in their daily task of matching individuals and assignments while at the same time satisfying

both the individuals and the units involved. Question 32, also elicited a great variety of answers. Generally, respondents felt that unit effectiveness had not been seriously impaired, but they attributed this to a large influx of junior officers with previous enlisted experience.

> Question 33: Do you consider the greatest weaknesses in today's aircraft maintenance officers to be in technical knowledge or in managerial skills? Please treat company grade and field grade separately in your responses.

This last question was encoded in two dimensions, company grade and field grade. Once again, content analysis was used to evaluate and classify the responses into one of seven response categories: managerial skills, technical knowledge, both, neither, leadership, other, or unknown. In the company grade dimension, the managerial skills response was chosen most frequently by 47.2 percent of the DCMs and 44.1 percent of the non-DCMs. The technical knowledge response was selected by 23.6 percent of the DCMs and 28.1 percent of the non-DCMs, while the responses including both appeared with a frequency of 20.8 percent and 17.1 percent respectively. In the field grade dimension, the managerial skills response, selected by 60.3 percent of the DCMs and 49.6 percent of the non-DCMs, attests to the growing importance of such skills as the AMO's responsibilities increase.

Interview Synopses

Between 19 and 29 March 1982, we conducted personal

interviews with senior maintenance managers representing TAC, SAC, MAC, ATC, and AFMPC. The personnel interviewed ranged from lieutenant to major general, from branch chiefs to deputy chiefs of staff for logistics, and from no maintenance experience to over 25 years in line maintenance units. On 15 April 1982, we visited AMOC and talked with course directors, instructors, and students. We completed our circuit on 8 June 1982 with interviews at the Air Staff where we met and talked with the personnel responsible for setting maintenance policy and guidance in the USAF. In all cases, we conducted the interviews using the standard questions we had developed. The results follow.

Military Airlift Command

Interviews with senior maintenance managers at MAC headquarters revealed mixed feelings about AMOC and the quality of AMOC graduates (70; 77; 96). While generally satisfied with the AMO produced, MAC officials have developed two programs to upgrade AMO training levels. The first program, outlined in MAC Regulation 50-14, "Maintenance Officer Orientation Training," has the following stated objectives:

> The objective of Maintenance Officer Orientation Training (MOOT) is to provide and expand experience so participants may respond competently to technical and managerial situations previously accomplished by more experienced maintenance officers. The MAC MOOT is designed to develop a broad familiarization with the the maintenance complex [and] is for, but not restricted to, second lieutenants with no prior aircraft maintenance experience [56:p. 1].

The program consists of three parts: specific weapon system

familiarization through FTD, structured unit training in each area of the maintenance organization, and orientation training sessions with experienced maintenance personnel, both enlisted and commissioned. The program is capped by rotating AMOs "throughout the maintenance complex for broader experience."

The second program, while still in the planning stage, would send AMOs to the academic phase of undergraduate pilot training for a specific weapon system. This program was conceived to meet what MAC judged as a significant weakness in the weapon system-specific knowledge of their AMOs. Completing this program would, in MAC's view, put the new AMOs on a more equal footing by arming them with a technical knowledge of their aircraft commensurate with that of the pilot operator.

The manager/technician debate found advocates at both ends of the argument, but these represented individual views rather than MAC philosophy. Indeed, all personnel interviewed endorsed and supported the command training initiatives. This seemed to stem in part from a conscious effort to manage and develop command AMO assets and to retain them within the MAC system. This effort usually supplemented, but occassionally replaced, AFMPC career management responsibilities. While some degree of MAJCOM stagnation inevitably resulted from such practices, MAC managers felt such action was warranted to amortize their training investment. If the second program were to become a reality, such efforts would probably intensify.

Finally, MAC staff officials strongly recommended the creation of intermediate and advanced professional maintenance management schools to provide the developmental links in the career progression chain. While none of those interviewed explicity condemned existing courses, they felt a major overhaul of such courses was long overdue. Recommendations for course content paralleled the survey recommendations previously described.

In summary, MAC maintenance managers were concerned and involved with improving their training programs and their career development policies. While their efforts were not superficial, they were certainly, and perhaps justifiably, parochial.

Strategic Air Command

Interviews with senior maintenance managers (59; 69; 95) at SAC revealed a pervasive, intense, and almost contagious enthusiasm about training and development innovations which, though recently begun, were already well underway. While marginally satisfied with AMOC and with the AMO produced, SAC managers had chosen to build upon that foundation by greatly expanding the technical knowledge and instilling a broad command perspective. The method SAC designed to meet these goals is the highly-structured and well-defined training program established in SAC Regulation 50-8 (80), "Aircraft Maintenance Training." This program contains three phases. Phase 1 involves a wing orientation, unit orientations, and task

observations. During this phase, the AMO tours the wing and unit organizations, receives briefings on unit missions, and observes common maintenance tasks such as aircraft towing and ground refueling. Phase 2 requires the AMO to attend an AMO-oriented FTD familiarization course on the assigned weapon system. Lastly, phase 3 involves completion of extensive and specific weapon system training through a SAC-administered correspondence course and through completion of a series of required readings and tape/filmstrip training modules.

Throughout this training, the new AMO is assigned to an experienced and fully-qualified training advisor. In addition, the assistant DCM is assigned as the new AMO's reporting official, thus involving higher management directly in the training process. Each AMO, upon completion of all phases, is required to write a critique of the program, which is then forwarded to SAC headquarters for review. Thus, SAC both completes the loop and oversees the process.

As at MAC, this program was prompted by what SAC managers viewed as an increasing deterioration in technical knowledge, especially weapon system-specific knowledge. Reacting to that perceived need, SAC commissioned the 4235th Strategic Training Wing at Carswell AFB, Texas, to develop and administer the current program. While it is still too soon to determine the effectiveness of the approach, SAC claims it has been highly received by all participating units and by an overwhelming majority of AMOs.

The manager/technician debate was once again supported at both ends of the argument, yet all of the SAC managers interviewed were squarely in favor of the command training initiatives. While these initiatives can be construed as entirely parochial in nature, SAC has much less control over its assets than MAC or TAC, for it has relatively few overseas bases to which it can internally rotate its personnel. Thus, SAC's training investment cannot be as easily recouped.

Finally, SAC senior maintenance managers were generally in favor of creating intermediate and advanced professional maintenance management schools, although some advocated more general approaches, such as the Master of Business Administration (MBA) degree, as a more realistic approach that avoids inbreeding. None considered the intermediate schools now available to be substantial enough or current enough to warrant endorsing them. Recommendations for course content once again paralleled those generated by the survey.

In summary, SAC maintenance managers were staunchly in favor of increasing the AMO's base of technical knowledge. Training efforts were well-defined and well-supported, but they did not seem to be integrated into a career development plan at anything beyond base level. For entry-level training, however, expecting anything more may simply be too much.

Tactical Air Command

Comments from staff officers at TAC (40; 64; 71; 91)

were highly critical of AMO training. Most felt that AMOC was training neither a manager nor a technician. Rather, the general feeling was that AMOC, in trying to teach toward the needs of the different commands, had simply produced a standard AMO for a non-standard Air Force. The supplementary training conducted by TAC, outlined in TAC Regulation 50-2 (82), "Maintenance Training," is structured into three phases. In Phase 1, the new AMO attends his particular weapon system FTD familiarization course. Phase 2 is an extended rotation program in which the new AMO is shifted through the maintenance complex to learn each area's function and its interactions with other maintenance activities. The final phase is a flightline and general safety education program. In this phase, the new AMO learns such things as aerospace ground equipment operation, fire extinguisher use, and ground emergency procedures. When asked how junior AMOs had performed under the prevailing conditions of increased responsibility, most staff officials agreed they had done well, but this opinion was qualified with the observation that a large number of these junior officers were formerly enlisted and had brought some maintenance experience with them.

In response to questions on the manager/technician issue, the general opinion was that all officers were managers regardless of rank. However, they also felt junior AMOs need a solid technical base to function successfully at unit level, while AMO positions further removed from the operational

mission require technical understanding only.

Senior TAC maintenance managers support the need for an intermediate maintenance management course outside of the traditional PME. They saw a need for a developmental course which taught maintenance-peculiar management approaches and techniques. Although the TAC maintenance management staff seemed to differ little from their MAC counterparts, they were more oriented to the operational mission and more divided on the relative importance of career development and training beyond that immediately needed to meet "the urgency of the moment." Indeed, attitudes and opinions seemed decidedly ambivalent and appeared to reflect a common perspective of mission accomplishment at all costs.

Air Training Command

The interviews we conducted at ATC (9; 26; 34; 65) were essentially of two types, those with senior maintenance officers on the operational side and those with the technical training staff. For interviews with personnel in the operational areas, we used the standard list of questions. However, this list was inappropriate for interviews with the technical training staff, so we adopted a freer format.

ATC on the whole believed AMO training was satisfactory. They had developed a supplemental training program with heavy maintenance management emphasis in topics such as manhour accounting, supply procedures, MMICS, and aircraft status reporting. ATC designed this course for company grade

officers, the top three enlisted grades, and civilians in grades GS-6 and above. While course critiques and student comment labeled it an outstanding school and well worthwhile, its content duplicated most of the AMOC maintenance management subjects. The school's course director attributed its success to the fact that its students had experience and a better perspective of the relevance of the course material to daily efforts.

A command philosophy never became evident from the interview responses. Instead, most opinions seemed to be of an individual nature and not readily associated with a command identity.

The job of the ATC technical training staff is not to supervise AMOC, but to coordinate among the MAJCOMs and other agencies to develop its curriculum. This office is responsible for planning and conducting the annual AMOC utilization and training workshop and the annual AMOC validation conference. At the workshop, representatives from all the MAJCOMs meet to discuss and recommend changes to update the AMOC training curriculum. The consensus resulting from the workshop is used by AMOC staff officers as guidance around which changes to AMOC are planned. The suggested course changes are then drafted into the formal instruction documents and presented back to the MAJCOMs at the validation conference for final approval. Headquarters USAF maintenance representatives frequently attend these meetings, but do not play an active role in, or provide direction to,

this process. This is left solely to the MAJCOMs. The most frustrating aspect of this process, according to ATC, is the frequent disagreement between the MAJCOMs over both the substance and the scope of the AMOC charter. AMOC usually takes the initiative by averaging or compromising the results in an attempt to please all the MAJCOMs. This process epitomizes the difficulty in designing a standard AMOC to satisfy a non-standard Air Force.

Aircraft Maintenance Officer Course

Interviews with staff officers and personnel at AMOC (23; 58; 84) revealed a general feeling of pride, both in the job they performed and in the students they produced to meet Air Force needs, but this pride did not blind them to complaints from the field. To them, one of the more difficult aspects of administering the AMO education program was the lack of a clear and consistent policy to shape course content. This lack of general guidance is contrasted by an abundance of specific guidance from the MAJCOMs during the annual utilization and training conferences. Unfortunately, there is no central authority to arbitrate and settle MAJCOM differences. The formal course review process is circumvented year-round by everyone from senior MAJCOM deputies and directors to recent graduates, all with parochial advice for course improvement.

Another factor the AMOC staff criticizes as detrimental to the quality of the average AMOC graduate is the

caliber of students it receives from our collegiate education system. The average college graduate comes to AMOC with a skill level in basic reading and writing at the tenth-grade level. AMOC has had to adjust the course material down to approximately eighth-grade level to compensate for this decline in these fundamental skills. This drop in basic ability has occurred simultaneously with an overall drop in technical ability, technical aptitude, and overall desire among AMOC student inputs. While the reasons for such declines may be very complex, AMOC must nevertheless take them into account during course refinements.

AMOC personnel tended to support a managerial emphasis when asked about the managerial/technical role of an AMO. This emphasis was also reflected in the AMOC curriculum, with 60 percent managerial instruction as opposed to 40 percent technical instruction. Opinions of existing intermediate level courses were generally low, and were qualified with the observation that such courses were not mandatory and did not test their students.

Air Force Military Personnel Center

The interviews at AFMPC (46; 72) reiterated many of the same opinions expressed by the MAJCOMs. AMOC graduates were perceived to be lacking in technical knowledge and the ability to apply it. AFMPC officials often expressed the opinion that while officers are managers and leaders first and foremost, they still need a strong base of technical

TABLE 2

Comparison of Authorized Versus Assigned Aircraft Maintenance Officers by Rank for the Years 1978 Through 1982 Adjusted for Short-Term Temporary Losses (2)

RANK	CATEGORY	1978	1979	1980	1981	1982
Colonel	Authorized	200	189	187	180	179
	Assigned	189	192	187	173	172
	Percent Manned	95%	102%	100%	96%	96%
Lt Colonel	Authorized	637	644	656	644	653
	Assigned	507	494	507	459	476
	Percent Manned	80%	77%	77%	71%	73%
Major	Authorized	793	794	807	787	815
	Assigned	741	740	694	680	703
	Percent Manned	93%	93%	86%	86%	86%
Captain	Authorized	1612	1646	1296	1547	1578
	Assigned	1318	1212	989	888	928
	Percent Manned	82%	74%	76%	57%	59%
Lieutenant	Authorized	235	209	532	294	296
	Assigned	677	785	1135	1359	1281
	Percent Manned	288%	376%	213%	462%	433%
Total	Authorized	3477	3104	3104	3092	3521
	Assigned	3432	3039	3138	3213	3560
	Percent Manned	99%	98%	101%	104%	101%

TABLE 3

Comparison of Total Assigned Aircraft Maintenance Officers
by Rank, Sex, and Aeronautical Rating
for the Years 1978 Through 1982 (1)

CLASSIFICATION	1978		1979		1980		1981		1982	
Colonel	192	5.1%	197	5.2%	200	5.1%	189	4.9%	182	4.8%
Lt Colonel	524	14.0%	510	13.5%	528	13.6%	485	12.6%	494	12.9%
Major	789	21.1%	800	21.2%	743	19.1%	729	19.0%	745	19.5%
Captain	1415	37.8%	1278	33.9%	1039	26.7%	972	25.3%	988	25.9%
Lieutenant	821	21.9%	984	26.1%	1373	35.3%	1465	38.2%	1415	37.0%
Female	183	4.9%	254	6.7%	384	9.9%	416	10.8%	420	11.0%
Pilot	633	16.9%	544	14.4%	738	19.0%	298	7.8%	304	8.0%
Navigator	177	4.7%	139	3.7%	95	2.4%	69	1.8%	57	1.5%
Total	3741	100.0%	3769	100.0%	3888	100.0%	3840	100.0%	3822	100.0%

knowledge to interpret technical directives and supervise technicians. In addition, they believe career education should be conducted in building-block fashion with specific skills and knowledge being developed as the AMO moves up the career ladder.

PALACE LOG staff officers essentially agreed with questions concerning non-compliance with AFR 36-23. AFMPC is responsible for the coordination and publication of the regulation while the Maintenance Policy Division at Headquarters USAF (HQ USAF/LEYM) is ultimately responsible for the writing. The functional managers at HQ USAF/LEYM are also responsible for developing the career field structure. Lieutenant Colonel Rose described the problem with AFR 36-23 most accurately when he said, "You can't write a career development guide if you don't know what your career field structure is [72]."

Future opportunities in the maintenance career field could be best described as optimistic. For the last five years, non-rated AMOs have been promoted to colonel well above the Air Force line (72). This increase in the promotability of the career AMO is a stepping-stone toward getting more non-rated general-level officers in the upper echelons of the logistics process.

AFMPC also supported the AFR 36-23 position concerning intra-field career broadening. While specialization at the beginning of a career may be realistic and desirable, subsequent development and progression should be more general

in nature. This would build a wider experience base from which to make sound, unbiased decisions in positions of increasing responsibility. But to comply with this portion of the regulation would require the cooperation of all the MAJCOMs. Many operate a mini-AFMPC to initiate or change intra-command assignments. Most MAJCOMs feel they could better fulfill their manpower needs if they had total control of "command-owned assets," both in the United States and overseas. As this is contrary to the intent of AFR 36-23, it creates occassional friction between the MAJCOMs and AFMPC.

During our interviews at AFMPC, we also found some very interesting facts about the AMO career field manning process. Yearly, Congress allots the Air Force a stable number of officer positions. Air Force then breaks this number down into each career area, with only slight fluctuations among areas from year to year. In the 40XX career field for 1982, lieutenant authorizations are only one-fifth of the number of authorized captains. The obvious question is how does one grow five captains from one lieutenant? Actual figures are covered in Tables 2 and 3. These statistics emphasize one reason why the rated supplement had been so heavily used in aircraft maintenance and partially accounts for the grade and experience imbalance we have today.

Air Staff

Our interviews culminated with senior Air Staff officials in the Maintenance Policy Division (LEYM) at

Headquarters USAF.

Senior managers at LEYM considered the AMOC product bland, at best. They attributed this not to any glaring deficiency in the AMOC faculty or method, but rather to leniency in accession standards, parochialism in curriculum content recommendations, and indifference in light of more pressing problems. They viewed the AMOC question from a systems perspective and preferred to define AMOC in terms of an ideal, but as yet unrealized, career development plan that spans an AMO's career. Toward that end, they saw AMOC as a technical school rather than a management school, and they described the entry-level AMO in similar terms.

The managers in LEYM recognized the problems in the career development and training of the AMO, but they also professed an impotence to resolve them. One reason stemmed from the fact that LEYM is a staff agency. Although LEYM stands as the central figure in the process of making policy and setting guidance for all Air Force maintenance units, MAJCOM nonconcurrence with such policy and guidance can, more often than not, delay or overturn it. Another reason was the relative urgency of the problem. Indeed, LEYM contended there were so many other pressing problems with so much greater impact that the AMO career development and training problems might never receive the attention they needed.

Intermediate maintenance management training was also of great concern to LEYM officials. They suggested existing courses were inadequate, primarily because they were voluntary.

Mandatory attendance toward mid-career, or selective attendance based on demonstrated ability and potential would enhance such training and provide an opportunity and incentive to progress professionally within the specialty.

The perception of a limited horizon for career AMOs due to rated officers clogging the channels for upward mobility was received with less surprise than consternation. LEYM officials were eager to demonstrate that the perception could not be substantiated by the facts. While they recognized that the perception existed and that such a situation had once prevailed, they proudly emphasized that the number of rated officers in the AMO career field had steadily declined, both as a real number and as a percentage of the AMO force.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

"Begin at the beginning," the King said, gravely, "and go on till you come to the end; then stop."

-- Alice in Wonderland, Lewis Carroll

This chapter represents the culmination of our research effort. After we examine AFR 36-23 to establish Air Force policy on AMO training and career development, we build a life-cycle model of the AFR 36-23 process. Using this model as the centerpiece for subsequent discussions, we examine the problems and weaknesses we have discovered in the model and offer an enhanced version of it. Finally, we close with our recommendations for improving the process and suggest some opportunities for further research into AMO career development.

AMO Training and Career Development--The USAF Perspective

AFR 36-23, "Officer Career Development," is the source document for USAF policy on that subject. It expands upon the introductory nature of AFR 36-1 by providing guidance on education and training, career progression, and assignments. The two themes repeatedly stressed throughout the AMO chapter, career broadening and experience, are not necessarily independent of one another.

According to AFR 36-23, career broadening is often

misinterpreted as retraining or complete withdrawal from maintenance. The purpose of career broadening is to give "selected career maintenance officers the opportunity to increase their potential through utilization in other career fields, and subsequently return them to maintenance duties [89:p. 23-2]."

The following passages provide some insight into AFR 36-23's emphasis on diversity:

> The personnel and materiel resources used in aircraft maintenance or munitions activities demand a high degree of professional competence in career maintenance managers with extensive and varied logistics support backgrounds. The aircraft maintenance and munitions career fields have been designed to create numerous opportunities for future senior maintenance managers to serve in different responsible positions in order to fully develop broad maintenance managerial skills [89:p. 23-1].
>
> Maintenance officers are encouraged to broaden their experience in their functional area. In that regard, [many] courses are available to provide necessary training to qualify maintenance officers for increased future responsibilities [89:p. 23-2].
>
> Maintenance officers are especially encouraged to broaden into other logistics career fields, for example, Supply (AFSC 64XX), Transportation (AFSC 60XX), Procurement (AFSC 65XX), and Logistics Plans (AFSC 66XX) [89:p. 23-3].
>
> ....exceptionally capable officers should be encouraged to seek broadening assignments as ATC maintenance instructors, Field Training Detachment (FTD) commanders, or duties outside the maintenance field [in other] logistics specialities [89:p. 23-4].
>
> Experience should be diversified....by rotating into different echelons of command, MAJCOMs, and geographical areas [89:p. 23-4].
>
> With the growth in the Tactical Air Force (TAF), maintenance officers should include at least one tour in the tactical environment in their career plan [89: p. 23-5].

> Maintenance officers are encouraged to seek diversity by lateral movement within their maintenance complex [89:p. 23-5].

> It is important to remember that career broadening is intended to give the maintenance officer an opportunity to learn and experience new management and supervisory roles for a definite period, then return to his or her primary career field, thus increasing his or her overall potential [89:p. 23-3].

Experience, then, is the common thread of the career broadening fabric, and is measurable by both length and breadth. It is obvious from these quotes that the Air Force's intention is to build a highly experienced, capable, and professional force of AMOs. The advantages gained by career broadening represent a conscious decision to pay the trade-off price, the loss of the functional area expert. The career model developed and explained in AFR 36-23 represents an intentional long-range plan for career development and progression. The goal of this plan is to fill certain

> ....designated career positions....considered to be so important to the effectiveness of maintenance functions that they require highly trained and experienced career maintenance officers....Proven ability in past maintenance duties is the most important factor in assigning an officer to a designated career postion [89:p. 23-2].

These designated career positions include Chief of Maintenance, Deputy Commander for Maintenance, Maintenance Control Officer, Maintenance Squadron Commander, and Director or Deputy Director of Maintenance (Engineering).

Using AFR 36-1 and AFR 36-23 as a guide, we developed the life cycle model of the AMO career field in Figure 5. Subsequent discussions revolve around this model.

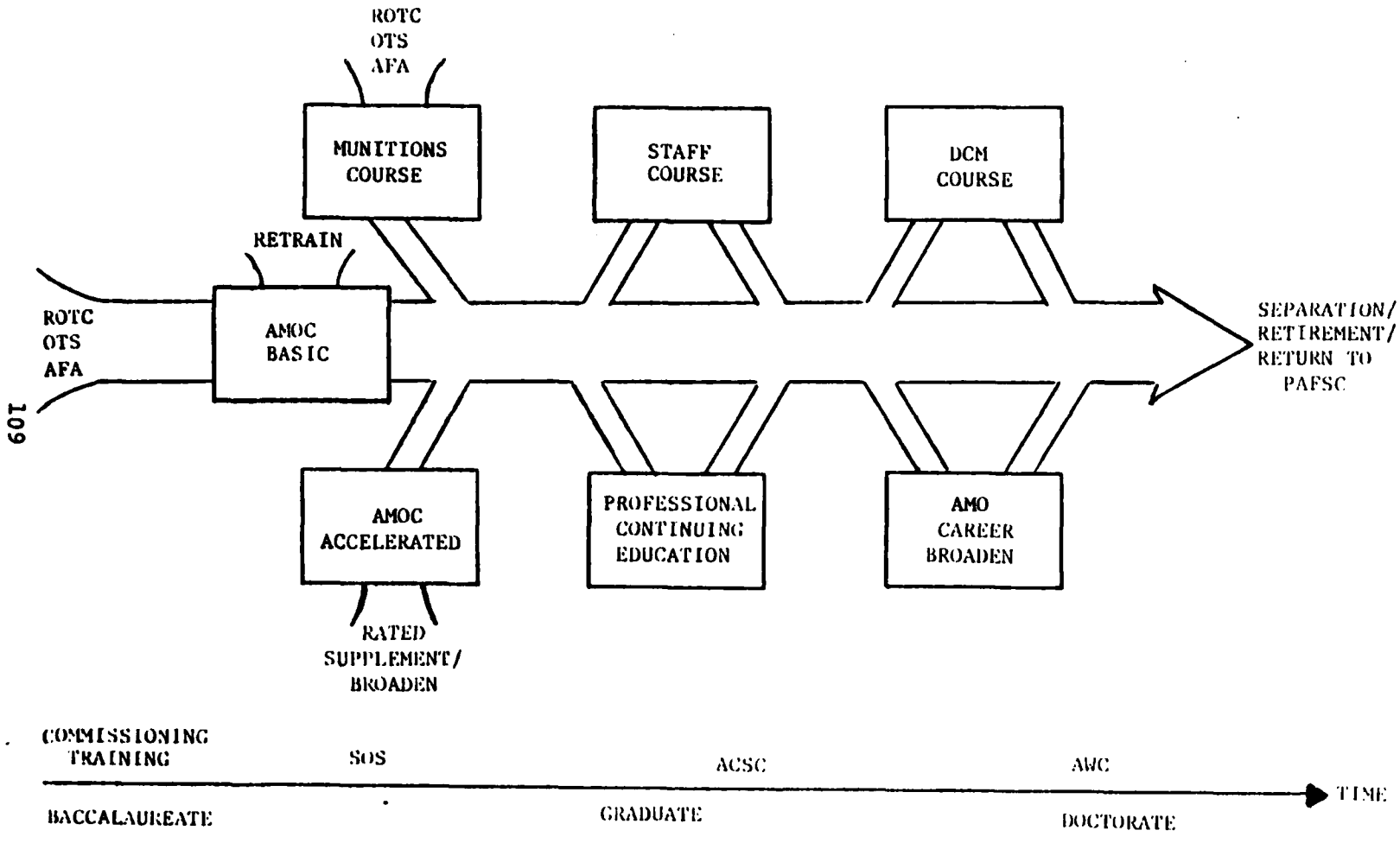


FIGURE 5.

Policy Model of the AMO Life-Cycle

A Policy Model of the AMO Life-Cycle

Entry-Level Training

There are four sources from which AMOs come: ROTC, Officer Training School (OTS), the USAF Academy, and cross-training. Selection from any one of the three commissioning sources is either by desire, as stated on an AF Form 90, or to meet the needs of the Air Force. Retraining is most frequently done voluntarily. Although AFR 36-1 contains no minimum qualifications for entry into the AMO career field, it does recommend that entrants possess an undergraduate degree in management or engineering.

The AMO career normally begins with the basic AMOC. Basic AMOC is currently five months long and is conducted only in-residence at Chanute AFB, Illinois. The course of instruction generally breaks down into a 60 percent/40 percent split between managerially- and technically-oriented subjects. Included under the management category are maintenance management, maintenance organization, and communications, including writing and briefing skills. Technically-oriented subjects include such topics as basic electricity, aerodynamics, electronics, aircraft utility systems, and propulsion systems.

According to AFR 36-23, assignments out of AMOC

> ....should be rotated among the various functions performed at squadron and wing levels. Performance and experience should be closely monitored....Complete understanding and knowledge of the Air Force Maintenance Management System should be acquired [89:p. 23-3].

The accelerated AMOC course was designed for the rated officer career broadening or supplementing maintenance. Instruction lasts four weeks and concentrates primarily on maintenance management. The course includes such topics as plans and scheduling, information systems, inspection programs, records maintenance, and the interactive logistics process.

AFR 36-23 provides carefully worded guidance about the role of the rated officer in maintenance:

> Because of their aeronautical backgrounds, rated officers with recent aircrew duty are ideal candidates to transit into maintenance. The pilot or navigator brings an intimate knowledge of flight problems that enhances his or her understanding of maintenance and aircraft munitions systems capabilities and limitations....Assignment of rated officers into maintenance duties must be carefully managed so as not to impede either the development of that officer or his or her career maintenance officer contemporaries....Designated Career Positions....were designed to make full use of professional maintenance officers and should not be filled by officers on career broadening assignments from other specialities. It is preferable to have a qualified career maintenance officer of lesser rank to fill a designated career position than an officer with the authorized rank who is on a broadening assignment [89:p. 23-3].

Crossflow training for Munitions Maintenance Officers is also conducted by AMOC. This course was not designed to retrain munitions officers, but to provide them with the instruction necessary for dual qualification. The Munitions Maintenance Officer Course at Lowry AFB conducts a similar crossflow course for AMOs. Award of the AFSC is contingent on the individual actually working in that field, and upgrading to the fully-qualified level requires 18 months of actual experience.

From Training to Application

As he continues along the time line, the AMO is expanding his base of experience by working in various maintenance jobs within the unit, but he is developing professionally as well. Toward mid-career, new job experiences more removed from the unit environment become available for the AMO, and staff jobs at any level from wing to HQ USAF are possible.

Completion of the Maintenance Staff Officer Course, located at Lowry AFB, Colorado, is encouraged though not mandatory. This course lasts three weeks and focuses on maintenance/logistics staff interactions. There are also two AFIT professional continuing education (PCE) courses available: Maintenance Management and Information Systems (LOG 261) and Applied Maintenance Management Concepts (LOG 262).

At this point in the AMO's career, the 401X AFSC is usually acquired by working in a position designated for that AFSC. Professional and postgraduate education both become important, with completion of ACSC recommended by any method, and work toward a graduate degree, preferably in management or logistics, suggested. Assignments during this intermediate period in the life-cycle should be rotated among commands, echelons of command, and geographic areas to provide diversified experience.

Once an AMO has developed a strong background, AFR 36-23 recommends career broadening experiences in the maintenance functional category (89:p. 23-2). Possibilities

include crossflow into munitions, maintenance instructor, non-maintenance directorates within the career field, OTS or ROTC instructor, or related fields such as logistics or engineering.

Further progression moves the AMO toward what AFR 36-23 refers to as designated career positions. To attain these positions, an AMO's qualifications should be high, experience broad, and ability proven. All major schooling, both professional and formal, should be completed or under way. Officers moving into the DCM position now have the opportunity to attend the new DCM course conducted by the LMDC. This course lasts two weeks and is conducted in a loosely-structured format which includes seminars, guest speakers, and case studies. The course mission statement is

> ....to provide newly assigned and inexperienced DCMs and assistants a comprehension of the responsibilities, resources, and operational concepts and practices of DCM organizations so they may more quickly and effectively fulfill their responsibilities as leaders and managers of base level maintenance operations [44:1].

Problems and Weaknesses

The career model described in AFR 36-23 represents a well-conceived, detailed, and comprehensive career plan for the development of professional maintenance managers. Unfortunately, even the best plans run amiss if the directions set forth are ignored, circumvented, or rationalized away. The following discussions are the result of several months of data collection, data analysis, and interviews, all designed to determine what problems and weaknesses have

surfaced to plague the policy model.

Accession Policies

The first problem in the model, related to maintenance accession policy, is the number of people entering the AMO career field who never wanted to be there in the first place. While there is no way to eliminate this completely, this population of dissatisfied new maintenance officers will be the most prone to crosstrain or resign, thereby increasing turnover and creating a need for more accessions (94). A related problem intimated by survey and interview sources (58; 65) concerns the caliber of the students arriving at AMOC, and at times in the field. The mean reading and writing skills of the college graduate entering AMOC are near the tenth-grade level. Whether this is an indictment of the maintenance accessions policy or our civilian education system is not important. AMOC's ability to produce competent maintenance officers will be impaired to the extent it must compensate for this educational shortcoming. AMOC is by no means an impossibly difficult course, but it can be relatively so for an off-the-street second lieutenant with little technical background or aptitude. The AMO entry policy established in AFR 36-1 and AFR 36-23 states that a degree in engineering or management is desirable. This seems to be an implicit recognition of the demanding nature of the aircraft maintenance profession, but such degrees are held by only a minority of those in the AMO

field. As measured by our survey, only 28.4 percent hold a degree in business, while 6.6 percent hold an engineering degree. Thus, almost two-thirds of the respondents failed to meet the desirable qualifications.

AMOC Versus the World

AMOC itself does not seem to be a problem, but there are certainly several unique to it. AMOC must design a course curriculum to accommodate a diverse student population while at the same time providing a solid foundation on which the AMO may subsequently develop. Not only is there a myriad of educational backgrounds, but a full spectrum of capabilities, aptitudes, and intelligence. It is not uncommon to get a mortuary science major or a college graduate with difficulties in the basic reading and communication skills, but it is even more common to get individuals who have never been exposed to a technical/mechanical environment and who do not want to be.

The variety in outbound assignments represents an equally challenging problem for AMOC. How does a 20-week school adequately train one student for an AFM 66-1 organization and another for an AFR 66-5 organization? Even within the same form of maintenance organization, there exist degrees of difference, and there are certainly substantial changes in philosophy between a MAC unit and a SAC unit. The list of jobs available to new AMOs presents another complication. The extremes range from maintaining mock-ups at Lowry AFB,

Colorado, to having complete maintenance responsibility for a squadron of F-16s at MacDill AFB, Florida. How can one school prepare a standard AMO for such a non-standard Air Force (22)? Perhaps the answer lies in systems theory, for certainly AMOC does not exist in a vacuum.

Another area for concern is the duplication in course content among the commissioning training, AMOC, SOS, ACSC, and staff officer course curriculums. Duplication, repetition, and rote represent valid educational techniques, but general management training and basic-level communication skills development have become a part of almost every training and educational activity to which USAF officers are exposed. At AMOC, the video-taped briefing each student is required to give takes the whole class one week to complete. These classroom hours, and the many other hours engaged with letter writing, mock counseling sessions, and similar general management activities could be used much more effectively. All three commissioning sources provide training in both introductory management and basic communication skills, although we must question how well, since so many students entering AMOC are deficient in these areas. Similarly, SOS and ACSC concentrate heavily on these areas of instruction. Finally, most AMOs assigned to an operational unit have frequent opportunities to brief senior managers and to write scores of reports and personnel evaluations. We consider the duplication injected by repeatedly stressing these management and communication skills at such a basic level to be inefficient and counterproductive. Instead,

we suggest these courses each build upon the skills introduced earlier by the others, creating a developmental chain to foster career growth.

Manager Versus Technician--Some Historical Notes

The AMO career field predates the Air Force by about two world wars. Military aviation in the United States officially began in 1907 with the formation of the Aeronautical Division of the United States Army Signal Corps. Until the end of 1917, the duties currently considered among those of the AMO were carried out by the signal officer/aviator. The onset of World War I spurred tremendous growth in military aviation and swelled the ranks with the aircraft mechanics needed by the Army. As the flying officer was diverted to more pressing war-related duties, and as military aviation continued to grow, a need became evident for a non-flying officer to manage the maintenance effort. Thus, engineering officers, as AMOs were called then, were sent to the Massachusetts Institute of Technology for three months of training on the duties they would encounter in the field: erection and maintenance of hangars and mobile machine shops, aircraft maintenance, maintenance of shops, stock and record maintenance, motor repair, and transportation (86:12).

During the 1920's, the engineering officer training program became organic at Chanute Field, Illinois. The course of instruction read very much like that for an aircraft mechanic and included aircraft welding, woodworking, dope and

fabric, sheet metal, engine overhaul, propeller balancing, electricity, hydraulics, and airframe and aeronautics. Administrative documentation of the aircraft maintenance effort became more common at this time as well (85). Training lasted approximately nine months with an obvious and almost total emphasis on the officer's technical knowledge. The senior maintenance manager was frequently selected simply because he was technically proficient.

This technically-oriented nine-month curriculum continued with little variation through the end of World War II. Toward the late 1940's, the Air Force began to see larger and more sophisticated aircraft enter the inventory. The old crew chief who knew everything about his aircraft gave way to an expanding army of specialists. The average number of manhours per flying hour was growing steadily due to increased inspections, more complicated systems, and decreasing expertise and training (85). A successful mission became more and more dependent on coordinating, planning, controlling, and monitoring a growing number of interrelated, complex tasks. Management was becoming increasingly important.

Just prior to the outbreak of the Korean Conflict, the AMO's initial education was reduced to 35 weeks, with hands-on training such as welding and airframe repair accounting for the bulk of the cut. The training emphasis was gravitating toward management in response to the AMO's changing environment. Another change came in the mid-1950's with a further reduction of the technical training and a commen-

surate increase in management. By 1968, pressure from the MAJCOMs, coupled with results from field surveys of AMOs, changed AMOC to 50 percent technically-oriented and 50 percent managerially-oriented, while instruction was reduced to 21 weeks. In 1975, when the avionics officer career field was consolidated into the AMO career field, AMOC was expanded to 24 weeks to accommodate the increased training requirements, but was again reduced in the fall of 1978 to 20 weeks when it was felt the technical aspects of avionics could easily be incorporated into the already existing technical training (85).

Currently, the AMOC course curriculum is arranged with 60 percent of the instruction time in management subjects. In the winter of 1981, an AMOC Utilization and Training Conference convened at Randolph AFB. The MAJCOMs expressed a unanimous desire for an expanded technical base of instruction. TAC also requested specific AFR 66-5 training be given to all officers who had follow-on assignments to TAF units. Interestingly, in lieu of approving a consolidation of the munitions and aircraft maintenance career fields, crossflow training continued at the two training schools.

The general trend in AMO training has been a decrease in the technical proportion of instruction concurrent with a decrease in the length of training. The general trend in the Air Force during this same period has been toward acquisition of a more complex aircraft: constructed of more exotic materials, capable of operating in greater environmental extremes, and ready to perform a greater variety

of missions. Is the AMO as flexible and prepared as the aircraft?

Manager Versus Technician Revisited

Recently, the 1980 Occupational Survey Report (62) documented the ten tasks AMOs rated highest in recommended training emphasis. The first eight were somewhat technical in nature. The last two, which were supevisory tasks, received lower training emphasis ratings, but were performed by relatively large percentages of AMOs (84). Questions 22 and 23 of our survey, which asked AMOs how much of their time was spent performing managerial or technical duties, showed managerial tasks consuming 75 percent of the AMOs time. While neither of these surveys should be construed as the last word in determining the proper mix of instruction, they highlight the problem of making such a decision. The OMC survey measured the number of tasks, ours measured the percentage of duty time expended, and the AMOC curriculum is apportioned by instructional hours. How does the number of tasks or the percentage of duty time translate into instructional hours? The relationship is certainly not clear.

As previously mentioned, MAJCOM desires represent the largest, if not the primary, influence for change in AMOC training content. Counterintuitively, training policy is dictated neither by Air Staff nor by ATC. Thus as AMOC is shaped by forces more attuned to short-term solutions, so it is denied the guidance of a long-term perspective. As one

man should not be expected to work for more than one boss, how can AMOC meet and satisfy the often conflicting demands of several MAJCOMs?

The last and perhaps most commonly heard criticism of AMOC is its location. The lack of an operational mission at Chanute AFB handicaps the new AMO by cheating him of a real world perspective (56). Thus the theory AMOC presents must remain an academic endeavor until the first operational assignment. Perhaps the success of the ATC Maintenance Management School is sufficient testimony for the criticism.

The Rated AMO

The accelerated AMOC course assumes the rated officer has already become technically proficient, at least aeronautically, and has been exposed to the military environment long enough to preclude in-depth training. But this assumption is not shared by everyone. There is a feeling among some AMOs that all officers entering the AMO field should get the same training. This harsh approach may be tempered by permitting proficiency advancement through those blocks of instructions already mastered. Another way to enter the AMO career field is unofficially. These "phantom" officers, as AFMPC calls them, are assigned to an operations position, but are working in maintenance. These "phantoms," as well as some rated supplement officers, usually have not attended an entry-level course. This unofficial existence and lack of proper training contradicts the intent of AFR 36-23.

The rated supplement and career broadening programs, which the accelerated course is designed to support, provide a healthy, and often essential, operational input into maintenance. Past overindulgence and overreliance on these programs provided the basis for the perception, held by many AMOs, that the rated officer was getting the better jobs in maintenance (62). Statistically and practically, this perception is becoming less and less accurate. Currently, rated supplement officers represent 9.5 percent of the AMO force, a decrease from 21.6 percent as recently as 1978.

The AMO and His Environment

The job stream for the AMO contains a number of inherent problems. AFR 36-23 recommends experience in more than one command to develop a basis for higher-level, more responsible positions, but in reality, what occurs is "MAJCOM stagnation." Flanigan and Little (25) showed there was indeed a relationship between an AMO's initial MAJCOM of assignment and his subsequent command assignments. Compliance with AFR 36-23 is further complicated by dual maintenance organizations. For example, an AMO moving from a TAC unit to a SAC unit, or vice-versa, must essentially be retrained and go through a period of low proficiency. Thus, retraining costs and reduced effectiveness are more than enough incentive to influence the MAJCOMs to keep their own people within the command. While the significance of such a situation is difficult to quantify, the effect is to deny many

AMOs the benefit of broadened experience.

As of March 1982, the AMO career field was manned with 433 percent lieutenants, 59 percent captains, and 86 percent majors, based on authorizations. This imbalance first occurred in the mid-seventies when the large proportion of rated supplement officers serving in maintenance after the Vietnam era were suddenly recalled to the cockpit, leaving a substantial gap. This grade imbalance subsequently fostered and aggravated a decline in the experience level of the AMO force. Younger and less experienced AMOs are now getting jobs of much greater responsibility as soon as they leave AMOC, but unfortunately, there are few experienced AMOs in the field to train them. Indeed, many of the survey respondents felt the only thing keeping maintenance from falling on its face was the number of prior enlisted AMOs who entered the field in the late 1970's.

The AMO's work environment is infamous for its high pressure, long hours, and few thanks. Most career AMOs soon accept these shortcomings and learn to live with them, but the long-term effects can be devastating. Indeed, many outstanding AMOs are denied the opportunity to continue their training or education simply because the DCM does not want to get along without them. Although the USAF encourages work on a post-graduate degree, it is frequently out of the question for the AMO because he cannot count on having the spare time available. These circumstances do not equate to reward for a job well done.

AFR 36-23 stresses career broadening and highly diversified experience, but once again practice contradicts policy. It is a commonly-held perception in aircraft maintenance that career broadening can be death to an otherwise successful career. Two of the recommended career broadening assignments, AMOC instructor and ROTC instructor, are particularly shunned for being "dead-end jobs." These perceptions are bred from the apparent low promotability of these jobs and from a general lack of command sponsorship at promotion boards while in such broadening assignments. Whether these perceptions agree with the facts is not the issue. The perception is there and must be dealt with.

Once the AMO has completed the first few assignments in the job stream, he has reached the intermediate level. This stage is characterized by increasingly responsible positions where greater management skills are required, skills which frequently differ from those acquired at unit level. The Maintenance Staff Officer Course is designed to provide intermediate education for the AMO moving into staff-level jobs. The first problem with this course was intimated earlier in the discussion of the work environment. Since attendance is not mandatory, only those officers the DCM can spare for three weeks will reap the benefit of the course. Comments on several of our surveys and in several of our interviews indicated that the most rewarding aspects of this course were "the Coors factory tour and the skiing." However, just because a course is not widely acclaimed does

not mean it is worthless. The majority of the subjects seem worthwhile and appropriate to intermediate level career education. However, like AMOC, it tends to duplicate training acquired in other courses in areas such as: communication techniques; the Planning, Programming, and Budgeting System (PPBS); and the USAF organization and structure. All of these topics are covered extensively in commissioning training and PME. The only other common sources of intermediate career education are the LOG 261 and LOG 262 professional continuing education (PCE) courses offered at AFIT. While these courses provide valuable instruction, they would seem more useful to officers or civilian equivalents who have not attended AMOC.

Although AFR 36-23 does not address it, a course is now available for the senior maintenance manager--the DCM course conducted at Maxwell AFB, Alabama. The very existence of this course is a contradiction to AFR 36-23, since its stated purpose is to train the senior officer with little or no experience in maintenance to become a DCM. This reinforces the perception among non-rated AMOs that career progression and the AMO career field are mutually exclusive terms. In open-ended responses to our questionnaire, more rated officers acknowleded the existence of this trend, and were harsher about its effects, than non-rated officers. The apparent practice of making the DCM job a stepping-stone to wing commander, a position normally closed to non-rated officers, is in sharp contrast to the word and intent of AFR 36-23, since the DCM is considered a designated career position.

Recommendations

Introduction

The previous sections of this chapter enumerated those areas our survey, interviews, and research identified as the problems and weaknesses currently existing in the AMO career field. In this section, we recommend actions we feel could reduce or eliminate these shortcomings and make the career field as strong as it was designed to be. During ensuing discussions, the reader should periodically refer to the enhanced career field life-cycle model portrayed in Figure 6 on the following page.

Accessions policy for the AMO career field represents a source of problems as well as manpower. If career field entry standards were introduced into this process, they could prevent the entrance into AMOC of officers without the necessary intelligence or aptitude to succeed (53). We feel this would decrease turnover by preventing borderline cases from beginning an AMO career before their lack of aptitude or desire resulted in failure. Assessment center technology demonstrates that the use of a validated screening device or selection technique is far more accurate as a predictor of probable success than any of the unstructured techniques currently employed (10; 12; 32; 36; 41). The Air Force Officer Qualification Test may represent an efficient method for testing basic knowledge and aptitude. We simply need to validate it for such use.

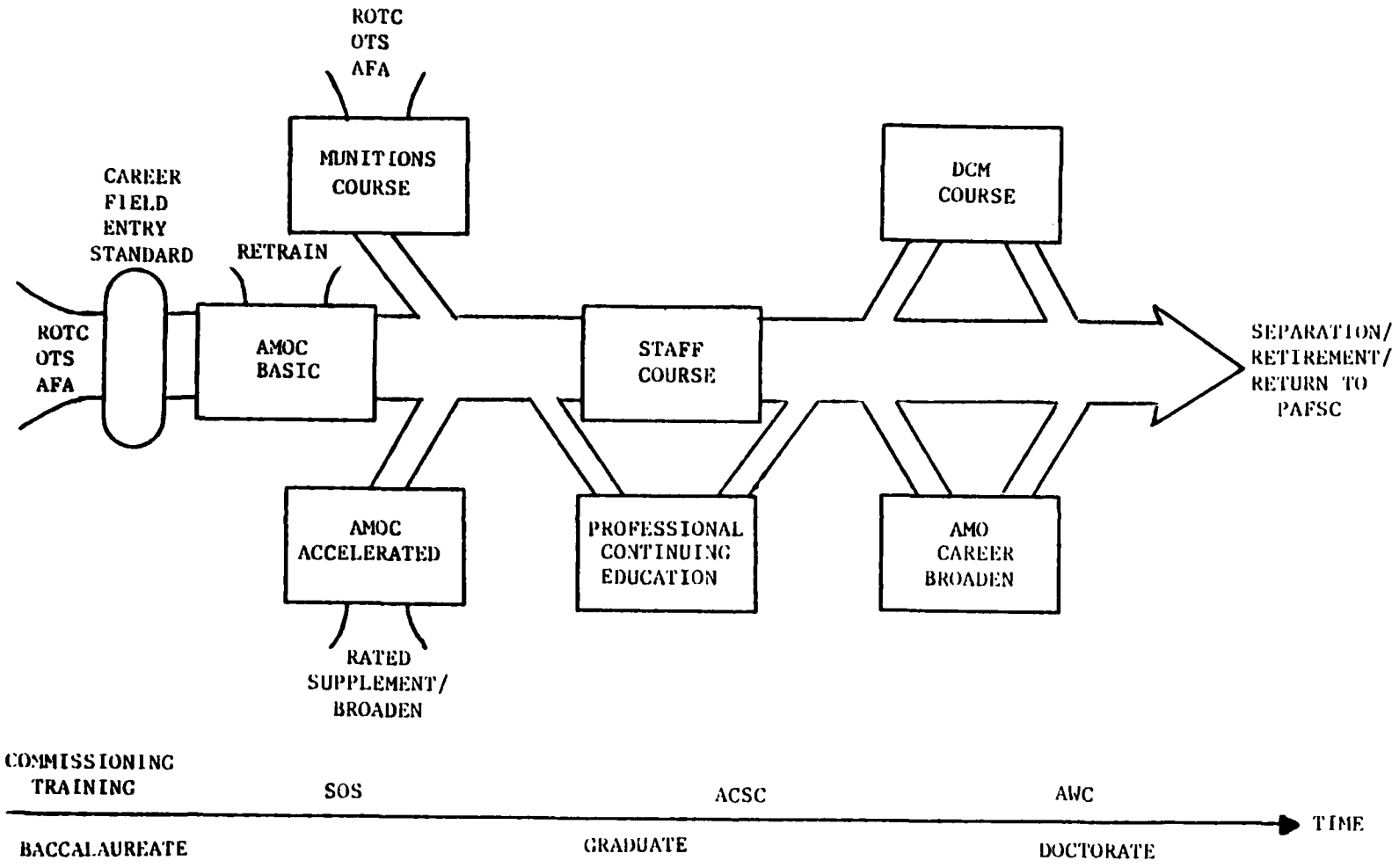


FIGURE 6.

Enhanced Model of the AMO Life-Cycle

Since there are few standards by which to judge it, AMOC represents the most difficult area in which to recommend improvements. AMO career education, especially AMOC, represents an excellent subject for future research. Such research should be accomplished from a systems perspective, viewing the career process as a whole, instead of isolating a portion of the career picture (53). Our recommendations stem from just such a viewpoint. Indeed, AMO career education and training should be structured in a building-block fashion, and the course content revised so the blocks dovetail and complement rather than conflict and overlap. A systems perspective would also aid in defining the charter of AMOC. Implicitly, AMOC must currently train the entry-level AMO for an entire career, since there is no subsequent mandatory training. The development of a progressive entry-level course would focus AMOC's efforts on preparing AMOs only for the first few assignments, followed by mandatory training to develop the skills necessary in mid-career assignments. Since entry-level training for an AMO is currently split 60 percent to 40 percent in favor of management, such an approach would require a significant shift in emphasis. The MAJCOMs and many survey respondents agree the AMOC curriculum is too heavily tipped toward the management end of the scale, especially for the entry-level AMO. While familiarization with maintenance management is certainly necessary, general management skills can be honed through several other mediums on the job and in the

classroom. Technical knowledge and familiarity, however, are learned primarily on the job, if the officer has the ambition to pursue it, and at FTD courses, if such courses are available. But both of these avenues are aligned to teaching weapon system-specific knowledge, which may be incomprehensible to a new AMO having little technical experience, background, or aptitude. Thus, AMOC should first concentrate on thoroughly arming the AMO with the basic skills necessary to comprehend and apply technical concepts and procedures such as troubleshooting, interpreting technical data, and maintaining complex aircraft systems. The independent development of technically-oriented training by the commands, especially SAC, testifies to the perceived importance of technical competence in the entry-level AMO.

A final recommendation for improved entry-level education concerns the location of the current course. While some AMOC classes get the opportunity to visit an operational base for one day, this hardly compares with the value of having an operational hydraulics shop to visit when discussing pneudraulics, or an engine shop when discussing propulsion systems (56). The ideal environment would be an ATC base where periodic visits by students would not interfere as greatly with the day-to-day maintenance routine as they would at a more mission-oriented base in SAC, TAC, or MAC. This recommendation was indirectly substantiated in the survey by 57.3 percent of the respondents.

Future research into the AMO career development pro-

cess should also consider intermediate education. Given that AMOC is changed to concentrate on the initial technical education of the entry-level AMO, the Maintenance Staff Officer Course should concentrate on developing the maintenance management skills necessary for progression into intermediate-level jobs. As with AMOC, this course should not duplicate, but build upon, the subject material in other career education offerings. To insure this comprehensive orientation to the career pattern, the staff course should be mandatory for all career AMOs.

Another area for further research is the alternative avenue for entry into the maintenance career field. Since we were unable to review and examine the Munitions Maintenance Officer Course and career field, this area should be examined as we examined the AMO career field. This is particularly important since the munitions field is an integral part of the 40XX career ladder and should not be ignored in the development of a comprehensive career plan.

Lastly, but most importantly, senior maintenance officials must define, establish, administer, and oversee the entire process of AMO education, training, and development (4; 6; 63; 93; 94). Without such stewardship, we feel that the AMO career development process will continue to be haphazard and disjointed. Only with such command involvement and concern can we hope to formulate the long-term goals and objectives necessary to guide developmental efforts and programs toward the future.

Conclusion

AFR 36-23 presents a well-conceived and comprehensive plan for AMO career development which incorporates many of the facets civilian theorists consider vital to the success of such programs. We feel that strict adherence to its dictates would eliminate many of the common complaints in the AMO career field and produce well-prepared, well-rounded senior maintenance managers capable of assuming the responsibilites inherent in higher-level logistics positions. This is especially true in the area of designated career positions. If these jobs were more available to those AMOs developed to fill them, the AMO career field would move closer to becoming a profession and career officers would be more inclined to remain in it (18; 39; 74).

Finally, with the career development process tied together by a chain of progressive education and training courses, the process should more effectively support, prepare, and develop the career AMO as an integral part of the aircraft maintenance community and of the greater logistics effort in which he is a participant.

Epilogue

When we joined the AFIT academic community from our operational environment, we carried with us the prejudices and often parochial perceptions of our contemporaries. As we embarked on our research, we naively anticipated our results and felt confident that we would find ample and sub-

stantial support for our predetermined position. We were wrong. We found that AFR 36-23 is indeed a useful guide for career development planning. We found, too, that AMOC should emphasize technical subjects rather than management if it is to fit into a progressive career development pattern. Finally, we found that the perception of rated officers getting the better jobs was essentially that--a perception. This study has served to strengthen our career intent and to introduce a resolve to help solve the problems rather than remain a part of them.

APPENDICES

APPENDIX A

AIRCRAFT MAINTENANCE OFFICER TRAINING AND CAREER DEVELOPMENT QUESTIONNAIRE

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (ATC)
WRIGHT-PATTERSON AIR FORCE BASE, OH 45433

REPLY TO ATTN OF: LSH (LSSR 57-82)/Capt C. Gatewood/1Lt T. Bair/AUTOVON 785-5361

SUBJECT: Aircraft Maintenance Officer Training and Career Management Questionnaire

TO:

1. The attached survey is part of an Air Force Institute of Technology (AFIT) research project prompted by the results of the occupational survey of the aircraft maintenance officer utilization field conducted in 1979 by the Occupational Measurement Center. This survey is being distributed to a random sample of aircraft maintenance officers and to a selected group of Deputy Commanders for Maintenance/Chiefs of Maintenance. It is designed to gather data from opinions, perceptions, and experiences relating to formal training, work environment, assignments, and career management.

2. In your position as a Deputy Commander for Maintenance/Chief of Maintenance, the state of the aircraft maintenance officer career field and the impact of current and proposed policies and programs upon unit effectiveness are known to you perhaps more intimately than at any other level. The intent of this survey and its parent research project is to identify the strengths and weaknesses that exist in selected areas. Any insights you can provide will be sincerely appreciated.

3. Based on your responses and comments, a research report will be written and produced by the fall of 1982. The report will be reviewed by managers at every level of the maintenance and logistics command structure. Your individual responses will, of course, be kept strictly confidential and will only be included in the published report in the aggregate. Although your participation in this survey is voluntary, I strongly urge you to complete this questionnaire and return it as soon as possible. Headquarters USAF Survey Control Number 82-23 has been assigned to this questionnaire.

4. Thank you for your cooperation and assistance. If you have any questions or recommendations regarding this survey, please contact either Captain Clinton F. Gatewood or 1Lt Timothy D. Bair at AUTOVON 785-5361.

JEROME G. PEPPERS, JR.
Acting Dean
School of Systems and Logistics

2 Atch
1. Questionnaire
2. Return Envelope

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (ATC)
WRIGHT-PATTERSON AIR FORCE BASE, OH 45433

REPLY TO ATTN OF: LSH (LSSR 57-82)/Capt C. Gatewood/1Lt T. Bair/AUTOVON 785-5361

SUBJECT: Aircraft Maintenance Officer Training and Career Management Questionnaire

TO:

1. You have been selected at random from a computer list provided by the Air Force Military Personnel Center (AFMPC) to participate in a survey of the aircraft maintenance officer utilization career field. This project is being conducted through the Air Force Institute of Technology (AFIT) as an integral part of a graduate research program. This survey is designed to gather data, based on your opinions, perceptions, and experiences and those of your fellow aircraft maintenance officers, concerning formal training, work environment, assignments, and career management. Headquarters USAF Survey Control Number 82-23 has been assigned to this questionnaire.

2. Based on your responses, a research report will be written and produced by the fall of 1982. The report will be reviewed by managers at every level of the maintenance and logistics command structure. Your individual responses will , of course, be kept strictly confidential and will only be included in the published report in the aggregate. Although your participation in this survey is voluntary, I strongly urge you to complete the attached questionnaire and return it as soon as possible. This research is for your benefit, and this represents an opportunity to make your voice heard at the policy-making level.

3. Thank you for your cooperation and assistance. If you have any questions or recommendations regarding this survey, please contact either Captain Clinton F. Gatewood or 1Lt Timothy D. Bair at AUTOVON 785-5361.

JEROME G. PEPPERS, JR.
Acting Dean
School of Systems and Logistics

2 Atch
1. Questionnaire
2. Return Envelope

PRIVACY STATEMENT

In accordance with paragraph 8, AFR 12-35, the following information is provided as required by the Privacy Act of 1974:

a. Authority:

(1) 5 U.S.C. 301, Departmental Regulations; and/or

(2) 10 U.S.C. 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation; and/or

(3) DOD Instruction 1100.13, 17Apr 68, Surveys of Department of Defense Personnel; and/or

(4) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

b. Principal Purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine Uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on the data provided, will be included in written master's theses and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

INSTRUCTIONS

1. Please complete all of the survey questions. Mark your answers directly on the survey form, either by checking the space(s) provided or by circling your choice of a response.

2. Once you have completed the survey, please remove the cover letter and return the remaining portion of the package in the envelope which was included with the package.

3. Thank you for your cooperation, time, and experienced viewpoint.

AIRCRAFT MAINTENANCE OFFICER TRAINING AND
CAREER MANAGEMENT QUESTIONNAIRE

1. What is your current grade?

- ☐ First Lieutenant
- ☐ Captain
- ☐ Major
- ☐ Lieutenant Colonel
- ☐ Colonel

2. How long have you held your current grade?

- ☐ Less than 1 year
- ☐ 1 year, but less than 2 years
- ☐ 2 years, but less than 3 years
- ☐ 3 years, but less than 4 years
- ☐ 4 years, but less than 5 years
- ☐ 5 years, but less than 6 years
- ☐ 6 years, but less than 7 years
- ☐ 7 years or more

3. How many years of active commissioned service do you have?

- ☐ Less than 2 years
- ☐ 2 years, but less than 4 years
- ☐ 4 years, but less than 6 years
- ☐ 6 years, but less than 8 years
- ☐ 8 years, but less than 10 years
- ☐ 10 years, but less than 12 years
- ☐ 12 years, but less than 14 years
- ☐ 14 years, but less than 16 years
- ☐ 16 years, but less than 18 years
- ☐ 18 years, but less than 20 years
- ☐ 20 years or more

4. What is your primary AFSC?

Prefix ☐ AFSC ☐☐☐☐ Suffix ☐

5. What is your duty AFSC?

Prefix ☐ AFSC ☐☐☐☐ Suffix ☐

6. What is your sex?

- ☐ Male
- ☐ Female

7. What is your age?

- ☐ Less than 21 years
- ☐ 21 - 25 years
- ☐ 26 - 30 years
- ☐ 31 - 35 years
- ☐ 36 - 40 years
- ☐ 41 - 45 years
- ☐ 46 - 50 years
- ☐ More than 50 years

8. What is your highest education level?

- ☐ High school or less
- ☐ Associate's degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Doctoral degree

9. What area is your bachelor's degree in?

- ☐ I do not have a bachelor's degree
- ☐ Engineering
- ☐ Business (accounting, economics, management, finance, etc.)
- ☐ Physical sciences (chemistry, physics, mathematics, etc.)
- ☐ Natural sciences (biology, zoology, pre-medical, etc.)
- ☐ Human sciences (psychology, sociology, anthropology, etc.)
- ☐ Fine Arts/Humanities (art, music, philosophy, history, religion, etc.)
- ☐ Other _____

10. How many of the following schools/courses have you completed?

- ☐ Aircraft Maintenance Officer Course (Basic)
- ☐ Aircraft Maintenance Officer Course (Accelerated)
- ☐ Avionics Maintenance Officer Course
- ☐ Munitions Maintenance Officer Course
- ☐ Staff Maintenance Officer Course
- ☐ Squadron Officer School (by any method)
- ☐ Air Command and Staff College (by any method)
- ☐ Air War College (by any method)
- ☐ Industrial College of the Armed Forces (by any method)

11. What command are you presently assigned to?

- ☐ SAC
- ☐ TAC
- ☐ MAC
- ☐ AFLC
- ☐ AFSC
- ☐ USAFE
- ☐ PACAF
- ☐ ATC
- ☐ HQ USAF
- ☐ NATO/MAAG
- ☐ Joint/Combined Staff
- ☐ Other _____

12. Prior to your present assignment, how many other commands had you been assigned to as a maintenance officer?

- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7 or more

13. What command level are you presently assigned to?

- ☐ Squadron
- ☐ Base
- ☐ Wing
- ☐ Air Division/ALC
- ☐ Numbered Air Force
- ☐ Major command
- ☐ HQ USAF
- ☐ Joint/Combined Staff
- ☐ Separate Operating Agency
- ☐ Other _____

14. Which of the following statements best describes your entry into the maintenance officer career field?

- ☐ Assigned only to the maintenance career field since commissioning
- ☐ Retrained into the maintenance career field from another AFSC
- ☐ Assigned to the maintenance career field to career-broaden (non-rated)
- ☐ Assigned to the maintenance career field to career-broaden (rated)
- ☐ Rated supplement to the maintenance career field
- ☐ Other _____

15. In addition to the AF Form 90, what other method(s) have you used to communicate with your career monitor at AFMPC?

- ☐ None
- ☐ Telephone conversations
- ☐ Personal interviews and/or record reviews at AFMPC
- ☐ Resumes and/or letters
- ☐ Other _____

16. Do you have prior enlisted service?

☐ Yes ☐ No

If you answered "yes," how many years? _____

17. Considering all military service, how many years of aircraft maintenance experience do you have?

- ☐ Less than 2 years
- ☐ 2 years, but less than 4 years
- ☐ 4 years, but less than 6 years
- ☐ 6 years, but less than 8 years
- ☐ 8 years, but less than 10 years
- ☐ 10 years, but less than 12 years
- ☐ 12 years, but less than 14 years
- ☐ 14 years, but less than 16 years
- ☐ 16 years, but less than 18 years
- ☐ 18 years, but less than 20 years
- ☐ 20 years or more

18. Are you currently assigned to a unit directly involved in the maintenance of aircraft?

☐ Yes ☐ No

If you answered "no," skip to question 25

19. What type of maintenance organizational structure are you presently assigned to?

- ☐ AFM 66-1
- ☐ AFR 66-5 (PCMO)
- ☐ Other _____

20. What term best describes the shift you normally work?

- ☐ Day (0800-1600)
- ☐ Swing (1600-2400)
- ☐ Midnight (2400-0800)
- ☐ Rotating

21. Over the last two years, how many times have you been the responsible maintenance officer during a deployment or exercise away from home station?

- ☐ None
- ☐ 1 time
- ☐ 2 times
- ☐ 3 times
- ☐ 4 times
- ☐ 5 times
- ☐ 6 times
- ☐ 7 times or more

22. How much of your time is spent performing "managerial" duties, such as personnel counseling, shift scheduling, attending meeting, reading/preparing reports, and similar activities?

- ☐ Less than 10%
- ☐ 10%, but less than 20%
- ☐ 20%, but less than 30%
- ☐ 30%, but less than 40%
- ☐ 40%, but less than 50%
- ☐ 50%, but less than 60%
- ☐ 60%, but less than 70%
- ☐ 70%, but less than 80%
- ☐ 80%, but less than 90%
- ☐ 90% or more

23. How much of your time is spent performing "technical" duties, such as assisting/directing troubleshooting, evaluating/inspecting completed maintenance actions, supervising servicing efforts, reviewing AFTO Forms 781, and similar activities?

- ☐ Less than 10%
- ☐ 10%, but less than 20%
- ☐ 20%, but less than 30%
- ☐ 30%, but less than 40%
- ☐ 40%, but less than 50%
- ☐ 50%, but less than 60%
- ☐ 60%, but less than 70%
- ☐ 70%, but less than 80%
- ☐ 80%, but less than 90%
- ☐ 90% or more

24. Did you attend an FTD familiarization course in your current weapon system?

- ☐ Yes
- ☐ No, but such a course is available
- ☐ No, but such a course is <u>not</u> available

25. Did you attend the basic Aircraft Maintenance Officer Course?

- ☐ Yes
- ☐ No

<u>If you answered "no," skip to question 29</u>

26. To what extent do you use what you learned at AMOC in the following subject areas in performing your duties and responsibilities as an aircraft maintenance officer? For example, you may consider a subject area to be relevant, in a larger sense, to what a maintenance officer might encounter, but for this question, to what extent do you use it in your job? Next to each subject area, circle the number that most closely corresponds to your answer based on the following 7-point scale:

7---------6---------5---------4---------3---------2---------1

Very Useful — Neither Useful Nor Useless — Very Useless

7 6 5 4 3 2 1	A.	Fundamental electricity
7 6 5 4 3 2 1	B.	Fundamental electronics
7 6 5 4 3 2 1	C.	Basic electronic systems
7 6 5 4 3 2 1	D.	Basic avionics systems
7 6 5 4 3 2 1	E.	Aerodynamics and aircraft structure
7 6 5 4 3 2 1	F.	Weight and balance
7 6 5 4 3 2 1	G.	Aerospace ground equipment
7 6 5 4 3 2 1	H.	Corrosion control, structural repair, and NDI
7 6 5 4 3 2 1	I.	Basic aircraft utility systems
7 6 5 4 3 2 1	J.	Aircraft engine systems and propulsion management
7 6 5 4 3 2 1	K.	Supply procedures and reports
7 6 5 4 3 2 1	L.	Aircraft forms (AFTO Forms 781) and historical records
7 6 5 4 3 2 1	M.	Maintenance data collection forms and reports
7 6 5 4 3 2 1	N.	Resources and financial management
7 6 5 4 3 2 1	O.	Personnel policies (military and civilian)
7 6 5 4 3 2 1	P.	Management techniques (counseling, briefing, in-basket)
7 6 5 4 3 2 1	Q.	Maintenance organizations and structures
7 6 5 4 3 2 1	R.	Ground safety and accident investigation
7 6 5 4 3 2 1	S.	Aircraft scheduling techniques
7 6 5 4 3 2 1	T.	Maintenance programs and policies
7 6 5 4 3 2 1	U.	Maintenance Management Information and Control System
7 6 5 4 3 2 1	V.	Maintenance inspection programs (MSEP and IG)
7 6 5 4 3 2 1	W.	Preventive maintenance and modification programs
7 6 5 4 3 2 1	X.	Technical orders and publications
7 6 5 4 3 2 1	Y.	Applied maintenance management principles
7 6 5 4 3 2 1	Z.	Job control simulation

27. To what extent would you recommend changing the AMOC curriculum emphasis in each of the following subject areas? Circle "+" for more emphasis, "=" for no change, and "-" for less emphasis.

+	=	-	A.	Fundamental electricity
+	=	-	B.	Fundamental electronics
+	=	-	C.	Basic electronic systems
+	=	-	D.	Basic avionics systems
+	=	-	E.	Aerodynamics and aircraft structure
+	=	-	F.	Weight and balance
+	=	-	G.	Aerospace ground equipment
+	=	-	H.	Corrosion control, structural repair, and NDI
+	=	-	I.	Basic aircraft utility systems
+	=	-	J.	Aircraft engine systems and propulsion management
+	=	-	K.	Supply procedures and reports
+	=	-	L.	Aircraft forms (AFTO Forms 781) and historical records
+	=	-	M.	Maintenance data collection forms and reports
+	=	-	N.	Resources and financial management
+	=	-	O.	Personnel policies (military and civilian)
+	=	-	P.	Management techniques (counseling, briefing, in-basket)
+	=	-	Q.	Maintenance organizations and structures
+	=	-	R.	Ground safety and accident investigation
+	=	-	S.	Aircraft scheduling techniques
+	=	-	T.	Maintenance programs and policies
+	=	-	U.	Maintenance Management Information and Control System
+	=	-	V.	Maintenance inspection programs (MSEP and IG)
+	=	-	W.	Preventive maintenance and modification programs
+	=	-	X.	Technical orders and publications
+	=	-	Y.	Applied maintenance management principles
+	=	-	Z.	Job control simulation

28. For each of the following statements, select and circle the number most closely corresponding to the extent of your agreement or disagreement, based on the following 7-point scale:

7---------6---------5---------4---------3---------2---------1

Strongly Agree — Neither Agree Nor Disagree — Strongly Disagree

7 6 5 4 3 2 1	A.	AMOC does a satisfactory job in preparing entry-level aircraft maintenance officers.
7 6 5 4 3 2 1	B.	AMOC teaches too much theory.
7 6 5 4 3 2 1	C.	AMOC training has little relevance beyond the first few assignments.

7 6 5 4 3 2 1 D. Personnel scheduled to attend AMOC should first be sent directly to their unit/command of assignment to gain some practical experience and perspective.

7 6 5 4 3 2 1 E. The course content of AMOC concentrates too much on the technical aspects of the job, and not enough on developing management skills, such as understanding human behavior and counseling individuals.

7 6 5 4 3 2 1 F. The course content of AMOC concentrates too much on the managerial aspects of the job, and not enough on developing technical knowledge to cope with complex modern weapon systems.

29. For each of the following statements, select and circle the number most closely corresponding to the extent of your agreement or disagreement, based on the following 7-point scale:

7---------6---------5---------4---------3---------2---------1

Strongly Agree — Neither Agree Nor Disagree — Strongly Disagree

7 6 5 4 3 2 1 A. Ideally, an aircraft maintenance officer should be a technician first and a manager second.

7 6 5 4 3 2 1 B. Intermediate and advanced professional maintenance management courses should be available to develop personnel as they progress up the career ladder.

7 6 5 4 3 2 1 C. The AF Form 90 is an efficient and practical means for expressing career objectives to AFMPC.

7 6 5 4 3 2 1 D. The aircraft maintenance career field offers greater challenges and a wider variety of responsibilities than other Air Force jobs.

7 6 5 4 3 2 1 E. I have little perspective on how far I should have progressed in my career pattern at any point in time.

7 6 5 4 3 2 1 F. Normal professional military education courses, such as SOS and ACSC, are sufficient alternatives to any proposed intermediate maintenance management courses.

7 6 5 4 3 2 1 G. Individual maintenance officers should frequently discuss career plans and goals with AFMPC by a means other than the AF Form 90.

7 6 5 4 3 2 1 H. A broad base of management skills is more important to an aircraft maintenance officer than a broad base of technical knowledge.

7 6 5 4 3 2 1 I. The best way to develop the skills and knowledge necessary for a position of increased responsibility in aircraft maintenance is through the "school of experience."

7 6 5 4 3 2 1	J.	The aircraft maintenance career managers at AFMPC satisfactorily match an individual's talents to the requirements of a job.
7 6 5 4 3 2 1	K.	When I am TDY with a unit, I am more of a technician than I am a manager.
7 6 5 4 3 2 1	L.	Rated supplement officers in the aircraft maintenance career field receive better job assignments than non-rated personnel.
7 6 5 4 3 2 1	M.	Overall, I am satisfied with the degree, depth, and scope of the maintenance training I have received so far.
7 6 5 4 3 2 1	N.	The main enance career managers at AFMPC adequately monitor and foster an individual's progression and development toward increased career responsibilities.
7 6 5 4 3 2 1	O.	If I have any weaknesses, they are primarily in technical knowledge.
7 6 5 4 3 2 1	P.	If I have any weaknesses, they are primarily in managerial skills.

30. Assuming that an intermediate maintenance management course were to be developed and offered, please answer the following questions:

A. Should it be mandatory or not, and why?

B. Who should attend it, and when in their career pattern?

C. What topic areas should it cover?

31. Assume that you are the AFMPC manager for the aircraft maintenance career field, and please answer the following questions:

A. What things would you consider in selecting an <u>individual</u> for an <u>assignment</u>?

B. What things would you consider in selecting an <u>assignment</u> for an <u>individual</u>?

32. Due to the shortage of experienced captains and majors in the maintenance career field, more entry-level and relatively inexperienced junior officers have been thrust into positions normally occupied by more experienced and seasoned officers.

A. How well trained have these officers been to accept such a challenge?

B. To what extent, if any, has your unit's effectiveness been impaired by this situation?

33. Do you consider the greatest weaknesses in today's aircraft maintenance officers to be in technical knowledge or in managerial skills? Please treat company grade and field grade separately in your response.

APPENDIX B

INTERVIEW QUESTIONS

INTERVIEW QUESTIONS FOR SENIOR MAINTENANCE MANAGERS

1. How do you feel about the training and capabilities of the officers being graduated from the Aircraft Maintenance Officer Course (AMOC) today?

2. Do you see AMOC as technician or manager oriented?

3. To what degree have you been required to supplement AMOs' training, if at all, and has this supplemental training been primarily technical in nature, such as FTD familiarization courses, or managerial?

4. Without considering fiscal limitations, do you think sending brand new AMOs to their unit first, then to AMOC, would improve their training by perhaps giving them a better perspective?

5. Junior officers are presently being assigned to positions normally occupied by more senior and more experienced officers. How well have these officers been prepared to meet this challenge, that is, to what degree may their success or failure be attributed to their training rather than to their individual talents and abilities?

6. Do you consider a company grade AMO a manager or a technician? Which should he/she be?

7. At what career point do you see this manager/technician mix changing, and in what direction?

8. Is there a need for intermediate and/or advanced training for the middle-level AMO?

9. How do you recommend such training be accomplished, through traditional PME (SOS, ACSC), through an intermediate level maintenance course, or through some other method, such as MBA?

10. To what extent do you recommend a career AMO strive to be a specialist (one command) or generalist (many commands) and why? Which would you prefer on your staff?

11. To what extent should MPC become involved in directing an AMO's career, that is, by striving to match talents and abilities to requirements in such a way as to foster career development along a mutually agreed upon career progressive plan?

12. The 1979 occupational survey of the aircraft maintenance officer career utilization field revealed that many

officers perceive rated supplements getting the more challenging jobs. What are your comments?

13. What do you see as the major challenges of the future for the maintenance officer?

APPENDIX C

LIST OF VARIABLES AND CODES USED IN SURVEY DATA BASE

LIST OF VARIABLES AND CODES USED IN SURVEY DATA BASE

CARD COLUMN(S)	VARIABLE(S)	QUESTION NUMBER(S)	RESPONSE	CODE
4	RANK	1	1LT	1
			CPT	2
			MAJ	3
			LTC	4
			COL	5
5	TIG	2	LESS THAN 1	1
			1-2	2
			2-3	3
			3-4	4
			4-5	5
			5-6	6
			6-7	7
			GREATER THAN 7	8
6-7	TAFCS	3	LESS THAN 2	01
			2-4	02
			4-6	03
			6-8	04
			8-10	05
			10-12	06
			12-14	07
			14-16	08
			16-18	09
			18-20	10
			GREATER THAN 20	11

CARD COLUMN(S)	VARIABLE(S)	QUESTION NUMBER(S)	RESPONSE	CODE
8	PREFIX	4	VARIABLE	AS IS
9-12	PAFSC	4	VARIABLE	AS IS
13	PREFIX	5	VARIABLE	AS IS
14-17	DAFSC	5	VARIABLE	AS IS
18	SEX	6	MALE	1
			FEMALE	2
19	AGE	7	LESS THAN 21	1
			21-25	2
			26-30	3
			31-35	4
			36-40	5
			41-45	6
			46-50	7
			GREATER THAN 50	8
20	DEGREE	8	HIGH SCHOOL OR LESS	1
			ASSOCIATE'S	2
			BACHELOR'S	3
			MASTER'S	4
			DOCTORAL	5
21	MAJOR	9	NO DEGREE	1
			ENGINEERING	2
			BUSINESS	3
			PHYSICAL SCIENCE	4
			NATURAL SCIENCE	5
			HUMAN SCIENCE	6

CARD COLUMN(S)	VARIABLE(S)	QUESTION NUMBER(S)	RESPONSE	CODE
21	MAJOR(CONT)	9	FINE ARTS	7
			OTHER	8
22-30	SCHOOLS	10	AMOC BASIC	YES=1
			AMOC ACCELERATED	1
			AVIONICS	1
			MUNITIONS	1
			STAFF	1
			SOS	1
			ACSC	1
			AWC	1
			ICAF	1
31-32	MAJCOM	11	SAC	01
			TAC	02
			MAC	03
			AFLC	04
			AFSC	05
			USAFE	06
			PACAF	07
			ATC	08
			HQUSAF	09
			NATO/MAAG	10
33	OTHCMD	12	0	1
			1	2
			2	3
			3	4

CARD COLUMN(S)	VARIABLE(S)	QUESTION NUMBER(S)	RESPONSE	CODE
33	OTHCMD(CONT)	12	4	5
			5	6
			6	7
			7 OR MORE	8
34-35	LVLCMD	13	SQUADRON	01
			BASE	02
			WING	03
			AIR DIVISION/ALC	04
			NUMBERED AIR FORCE	05
			MAJOR COMMAND	06
			HQUSAF	07
			JOINT/COMB STAFF	08
			SOA	09
			OTHER	10
36	ENTRY	14	SINCE COMMISSIONING	1
			RETRAIN	2
			NON-RATED BROAD.	3
			RATED BROADENING	4
			RATED SUPPLEMENT	5
			OTHER	6
37-41	FORM 90	15	NONE	YES=1
			TELECOM	1
			PERSONAL INTERVIEW	1
			RESUME/LETTER	1
			OTHER	1

CARD COLUMN(S)	VARIABLE(S)	QUESTION NUMBER(S)	RESPONSE	CODE
42	ENLIST	16	YES	1
			NO	2
43-44	YRS EXP	17	LESS THAN 2	01
			2-4	02
			4-6	03
			6-8	04
			8-10	05
			10-12	06
			12-14	07
			14-16	08
			16-18	09
			18-20	10
			GREATER THAN 20	11
45	MX UNIT	18	YES	1
			NO	2
46	ORGAN	19	AFM 66-1	1
			AFR 66-5	2
			OTHER	3
47	SHIFT	20	DAYS	1
			SWINGS	2
			MIDS	3
			ROTATE	4
48	DEPLOY	21	NONE	1
			1	2
			2	3

CARD COLUMN(S)	VARIABLE(S)	QUESTION NUMBER(S)	RESPONSE	CODE
48	DEPLOY(CONT)	21	3	4
			4	5
			5	6
			6	7
			7 OR MORE	8
49-50	MGR	22	LESS THAN 10%	01
			10-20%	02
			20-30%	03
			30-40%	04
			40-50%	05
			50-60%	06
			60-70%	07
			70-80%	08
			80-90%	09
			90-100%	10
51-52	TECH	23	LESS THAN 10%	01
			10-20%	02
			20-30%	03
			30-40%	04
			40-50%	05
			50-60%	06
			60-70%	07
			70-80%	08
			80-90%	09
			90-100%	10

CARD COLUMN(S)	VARIABLE(S)	QUESTION NUMBER(S)	RESPONSE	CODE
53	FTD	24	YES	1
			NO BUT AVAILABLE	2
			NOT AVAILABLE	3
54-79	ANS 101-126	26A-Z	1=VERY USEFUL	1
			2	2
			3	3
			4=NEITHER	4
			5	5
			6	6
			7=VERY USELESS	7
80-105	ANS 201-226	27A-Z	(+)=MORE EMPHASIS	1
			(=)=NO CHANGE	2
			(-)=LESS EMPHASIS	3
106-111	ANS 301-306	28A-F	1=STRONGLY DISAGREE	1
			2	2
			3	3
			4=EITHER	4
			5	5
			6	6
			7=STRONGLY AGREE	7
112-127	ANS 307-322	29A-P	SAME AS QUESTION 28	
128	CMT 1	30	MANDATORY	1
			VOLUNTARY	2
			NOT NEEDED	3

CARD COLUMN(S)	VARIABLE(S)	QUESTION NUMBER(S)	RESPONSE	CODE
			DON'T KNOW	4
			SELECTIVE	5
129	CMT 2	33	TECHNICAL	1
			MANAGERIAL	2
			BOTH	3
			OTHER	4
			DON'T KNOW	5
			NEITHER	6
130	CMT 3	33	TECHNICAL	1
			MANAGERIAL	2
			BOTH	3
			LEADERSHIP	4
			OTHER	5
			DON'T KNOW	6
			NEITHER	7

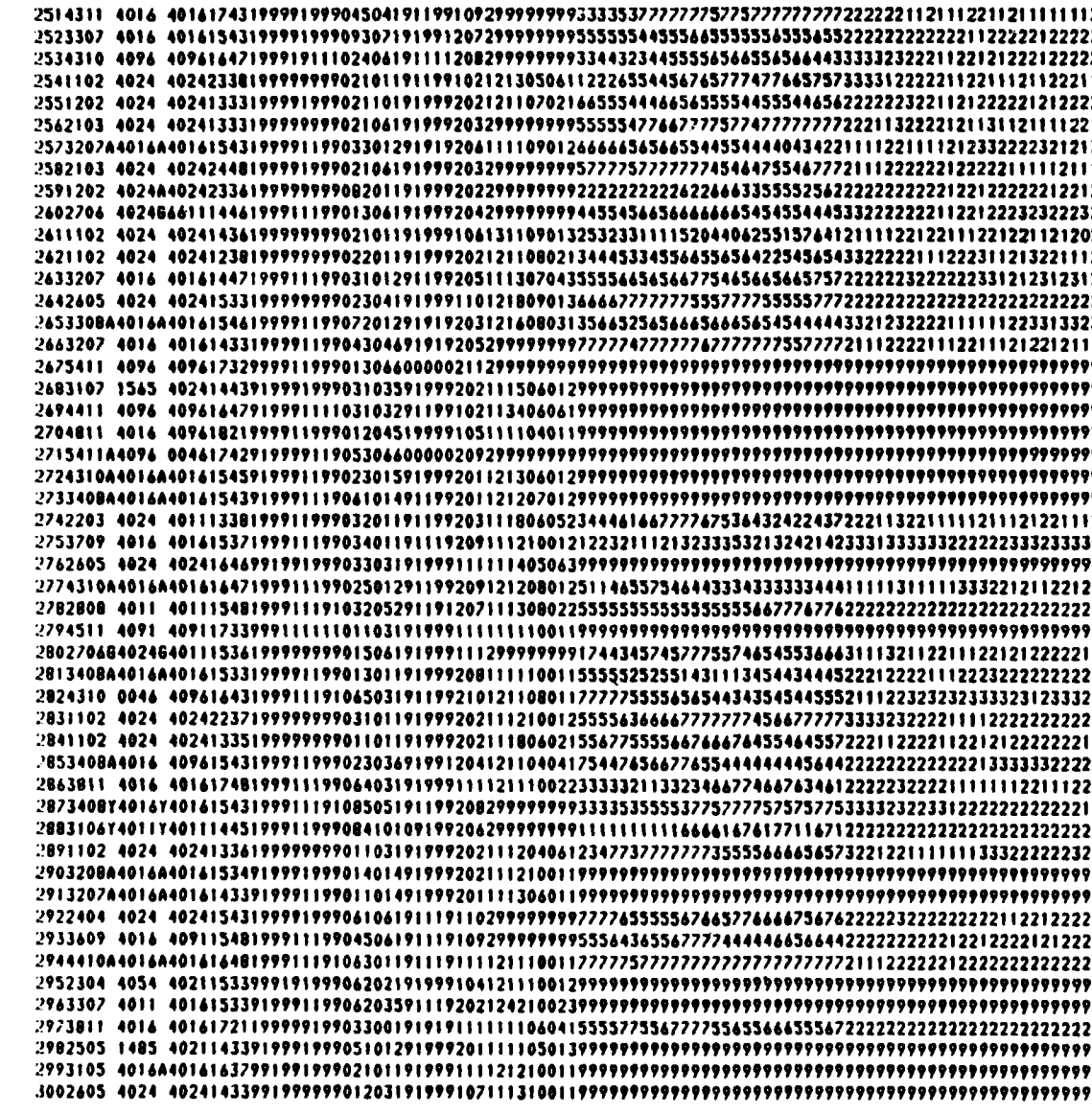
NOTES:

1. Card column 1 through 3 contain the sequence number for each individual response. This sequence number represents the order in which the response were returned. Sequence numbers 1 through 470 correspond to non-DCM respondents, while 841 through 920 correspond to DCM respondents.

2. A coded value of "0" or "00" indicates that the respondent did not answer that question. A coded value of "9" or "99" indicates that the respondent was not required to provide an answer.

APPENDIX D

SURVEY DATA BASE



APPENDIX E

FREQUENCY ANALYSIS OF SURVEY DEMOGRAPHICS

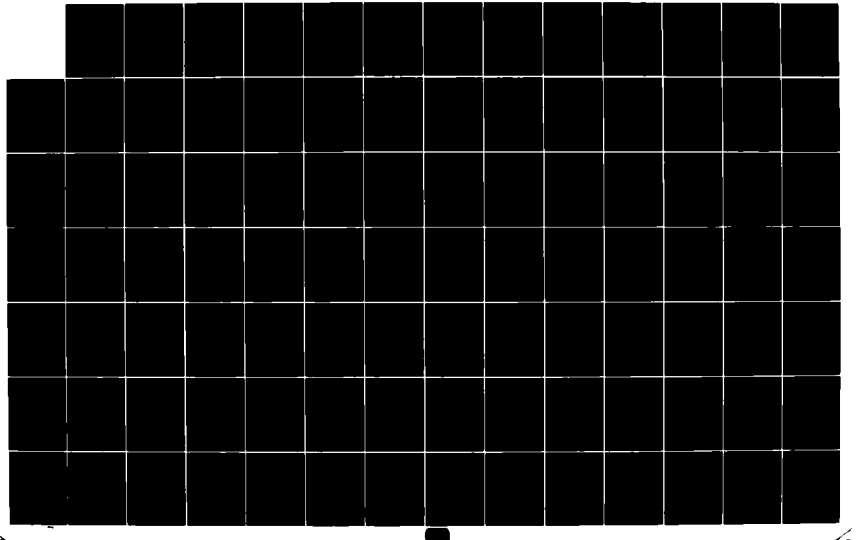
		MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
RANK		2.70	4.43	2.40						
	1LT				131	2	129	23.8	2.5	27.4
	CPT				131	0	131	23.8	0.0	27.9
	MAJ				127	14	113	23.1	17.5	24.0
	LTC				95	10	85	17.3	12.5	18.1
	COL				66	54	12	12.0	67.5	2.6
TAFCS		6.38	9.95	5.77						
	LESS THAN 2				1	0	1	0.2	0.0	0.2
	2-4 YEARS				129	2	127	23.5	2.5	27.1
	4-6 YEARS				44	0	44	8.0	0.0	9.4
	6-8 YEARS				33	0	33	6.0	0.0	7.0
	8-10 YEARS				27	0	27	4.9	0.0	5.8
	10-12 YEARS				23	0	23	4.2	0.0	4.9
	12-14 YEARS				38	4	34	6.9	5.0	7.2
	14-16 YEARS				75	11	64	13.7	13.8	13.6
	16-18 YEARS				33	5	28	6.0	6.3	6.4

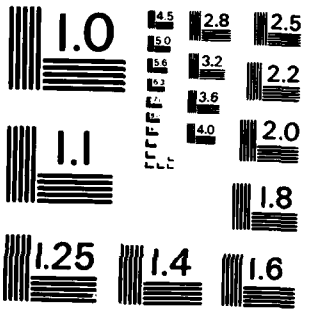
VARIABLE	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
		ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
TAFCS (CONT)										
	18-20 YEARS				62	7	55	11.3	8.7	11.7
	MORE THAN 20				84	51	33	15.3	63.7	7.0
SEX										
	MALE				504	80	424	91.6	100.0	90.2
	FEMALE				46	0	46	8.4	0.0	9.8
AGE		4.74	6.26	4.47						
	LESS THAN 21				0	0	0	0.0	0.0	0.0
	21-25 YEARS				20	0	20	3.6	0.0	4.3
	26-30 YEARS				103	1	102	18.7	1.2	21.7
	31-35 YEARS				120	3	117	21.8	3.8	24.9
	36-40 YEARS				143	15	128	26.0	18.8	27.2
	41-45 YEARS				104	26	78	26.0	18.8	27.2
	46-50 YEARS				44	25	19	8.0	31.3	4.0
	51 OR OLDER				16	10	6	2.9	12.5	1.3

AD-A122 998 A CRITICAL SURVEY OF AIRCRAFT MAINTENANCE OFFICER TRAINING AND CAREER DEVELOPMENT(U) AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYST..

3/4

UNCLASSIFIED T D BAIR ET AL. SEP 82 AFIT-LSSR-87-82 F/G 5/9 NL





VARIABLE	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
		ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
DEGREE										
	HIGH SCHOOL				2	0	2	0.4	0.0	0.4
	ASSOCIATES				4	4	4	0.7	0.0	0.9
	BACHELORS				281	36	245	51.1	45.0	52.1
	MASTERS				260	44	216	47.3	55.0	46.0
	DOCTORAL				3	0	3	0.5	0.0	0.6
MAJOR										
	NO DEGREE				6	0	6	1.1	0.0	1.3
	ENGINEERING				36	8	28	6.6	10.0	6.0
	BUSINESS				156	27	129	28.4	13.7	27.5
	PHYSICAL SCIENCE				48	4	44	8.7	5.0	9.4
	NATURAL SCIENCE				41	4	37	7.5	5.0	7.9
	HUMAN SCIENCE				74	8	66	13.5	10.0	14.1
	HUMAN-FINE ARTS				86	11	75	15.7	13.8	16.0
	OTHER				102	18	84	18.6	22.5	17.9

VARIABLE	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
		ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
SCHOOLS										
	AMOC-BASIC				355	26	329	64.5	32.5	70.0
	AMOC-ACCEL				86	24	62	15.6	30.0	13.2
	AVIONICS				42	6	36	7.6	7.5	7.7
	MUNITIONS				60	5	55	10.9	6.3	11.7
	STAFF COURSE				169	31	138	30.7	38.8	29.4
	SOS				390	66	324	70.9	82.5	68.9
	ACSC				274	64	210	49.8	80.0	44.7
	AWC				55	17	38	10.0	21.3	8.1
	ICAF				117	47	70	21.3	58.8	14.9
MAJCOM										
	SAC				107	18	89	19.5	22.5	19.0
	TAC				141	20	121	25.7	25.0	25.8
	MAC				92	18	74	16.8	22.5	15.8
	AFLC				32	1	31	5.8	1.2	6.6
	AFSC				15	3	12	2.7	3.8	2.6
	USAFE				38	6	32	6.9	7.5	6.8

VARIABLE	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
		ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
MAJCOM (CONT)										
	PACAF				17	5	12	3.1	6.3	2.6
	ATC				82	7	75	14.9	8.7	16.0
	HQ USAF				13	0	13	2.4	0.0	2.0
	NATO-MAAG				0	0	0	0.0	0.0	0.0
	JOINT-COMB				1	0	1	0.2	0.0	0.2
	OTHER				11	2	9	2.0	2.5	1.9
OTHCMD		2.47	2.50	2.47						
	NONE				213	33	180	38.8	41.3	38.4
	1				94	14	80	17.1	17.5	17.1
	2				103	9	94	18.8	11.2	20.0
	3				75	13	62	13.7	16.2	13.2
	4				42	6	36	7.7	7.5	7.7
	5				17	5	12	3.1	6.3	2.6
	6				5	0	5	0.9	0.0	1.1
	7 OR MORE				0	0	0	0.0	0.0	0.0

VARIABLE	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
		ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
LVLCMD										
	SQUADRON				224	17	207	40.9	21.3	44.2
	BASE				5	0	5	0.9	0.0	1.1
	WING				147	55	92	26.8	68.8	19.7
	ALC-DIVISION				21	0	21	3.8	0.0	4.5
	NAF				25	1	24	4.6	1.2	5.1
	MAJCOM				66	1	65	12.0	1.2	13.9
	HG USAF				10	0	10	1.8	0.0	2.1
	JOINT-COMB				2	1	1	0.4	1.2	0.2
	SOA				12	0	12	2.2	0.0	2.6
	OTHER				36	5	31	6.6	6.3	6.6
ENTRY										
	COMMISSIONING				366	22	344	66.7	27.5	73.3
	RETRAINED				52	11	41	9.5	13.8	8.7
	BROADEN				4	0	4	0.7	0.0	0.9
	BROADEN (RATED)				48	22	26	8.7	27.5	5.5

VARIABLE	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
		ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ENTRY (CONT)										
	RATED (SUPP)				43	17	26	7.8	21.3	5.5
	OTHER				36	8	28	6.6	10.0	6.0
FORM 90										
	NONE				32	1	31	5.8	1.3	6.6
	TELEPHONE				434	24	410	78.9	30.0	87.2
	PERSONAL				216	15	201	39.3	18.8	42.8
	WRITTEN				83	6	77	15.1	7.5	16.4
	OTHER				16	0	16	2.9	0.0	3.4
ENLIST										
	YES				188	25	163	34.2	31.3	34.8
	NO				361	55	306	65.8	68.8	65.2
ORGN										
	AFM 66-1				210	44	166	56.0	59.5	55.1
	AFR 66-5				151	26	125	40.3	35.1	41.5
	OTHER				14	4	10	3.7	5.4	3.3

		MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
YRSEXP		5.22	5.46	5.17						
	LESS THAN 2				52	5	47	9.5	6.3	10.0
	2-4 YEARS				113	15	98	20.6	18.8	20.9
	4-6 YEARS				60	12	48	10.9	15.0	10.2
	6-8 YEARS				47	6	41	8.6	7.5	8.7
	8-10 YEARS				29	4	25	5.3	5.0	5.3
	10-12 YEARS				38	7	31	6.9	8.7	6.6
	12-14 YEARS				47	5	42	8.6	6.3	9.0
	14-16 YEARS				59	9	50	10.7	11.2	10.7
	16-18 YEARS				29	4	25	5.3	5.0	5.3
	18-20 YEARS				43	6	37	7.8	7.5	7.9
	MORE THAN 20				32	7	25	5.8	8.7	5.3
MXUNIT										
	YES				377	74	303	68.5	92.5	64.5
	NO				173	6	167	31.5	7.5	35.5
SHIFT										
	DAYS				343	70	273	91.0	94.6	90.1

VARIABLE	VALUE	MEAN ALL	MEAN DCM	MEAN NONDCM	ABSOLUTE FREQUENCY ALL	ABSOLUTE FREQUENCY DCM	ABSOLUTE FREQUENCY NONDCM	ADJUSTED FREQUENCY ALL	ADJUSTED FREQUENCY DCM	ADJUSTED FREQUENCY NONDCM
SHIFT (CONT)										
	SWINGS				5	0	5	1.3	0.0	1.7
	MIDS				3	0	3	0.8	0.0	1.0
	ROTATING				26	4	22	6.9	5.4	7.3
DEPLOY		2.31	2.11	2.36						
	NONE				194	43	151	51.6	58.1	50.0
	1				65	13	52	17.3	17.6	17.2
	2				41	5	36	10.9	6.8	11.9
	3				22	4	18	5.9	5.4	6.0
	4				22	4	18	5.9	5.4	6.0
	5				14	2	12	3.7	2.7	4.0
	6				4	0	4	1.1	0.0	1.3
	7 OR MORE				14	3	11	3.7	4.1	3.6
MGR		7.52	7.52	7.52						
	LESS THAN 10%				6	2	4	1.6	2.7	1.3
	10%-20%				4	0	4	1.1	0.0	1.3
	20%-30%				9	2	7	2.4	2.7	2.3

VARIABLE	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
		ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
MGR (CONT)										
	30%-40%				22	4	18	5.9	5.5	6.0
	40%-50%				20	2	18	5.4	2.7	6.0
	50%-60%				52	11	41	13.9	15.1	13.7
	60%-70%				46	8	38	12.3	11.0	12.7
	70%-80%				69	16	53	18.5	21.9	17.7
	80%-90%				59	15	44	15.8	20.5	14.7
	MORE THAN 90%				86	13	73	23.1	17.8	24.3
TECH		2.37	1.86	2.49						
	LESS THAN 10%				169	40	129	45.3	54.8	43.0
	10%-20%				69	15	54	18.5	20.5	18.0
	20%-30%				51	11	40	13.7	15.1	13.3
	30%-40%				37	3	34	9.9	4.1	11.3
	40%-50%				19	3	16	5.1	4.1	5.3
	50%-60%				22	1	21	5.9	1.4	7.0
	60%-70%				2	0	2	0.5	0.0	0.7
	70%-80%				3	0	3	0.8	0.0	1.0

VARIABLE	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
		ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
TECH (CONT)										
	80%-90%				0	0	0	0.0	0.0	0.0
	MORE THAN 90%				1	0	1	0.3	0.0	0.3
FTD										
	YES				183	24	159	48.7	32.4	52.6
	NO				143	40	103	38.0	54.1	34.1
	NOT AVAILABLE				50	10	40	13.3	13.5	13.2
CIT1										
	MANDATORY				283	47	236	56.4	64.4	55.0
	VOLUNTARY				180	19	161	35.9	26.0	37.5
	NOT NEEDED				15	1	14	3.0	1.4	3.3
	DON'T KNOW				2	0	2	0.4	0.0	0.5
	SELECTIVE				22	6	16	4.4	8.2	3.7
CIT2										
	TECHNICAL				131	17	114	27.4	23.6	28.1
	MANAGERIAL				213	34	179	44.6	47.2	44.1
	BOTH				87	15	72	18.2	20.8	17.1

VARIABLE	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
		ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
CMT2 (CONT)										
	LEADERSHIP				15	3	12	3.1	4.2	3.0
	OTHER				5	1	4	1.0	1.4	1.0
	DON'T KNOW				10	0	10	2.1	0.0	2.5
	NEITHER				17	2	15	3.6	2.8	3.7
CMT3										
	TECHNICAL				84	10	74	19.3	14.7	20.2
	MANAGERIAL				223	41	182	51.3	60.3	49.6
	BOTH				57	9	48	13.1	13.2	13.1
	LEADERSHIP				20	3	17	4.6	4.4	4.6
	OTHER				18	2	16	4.1	2.9	4.4
	DON'T KNOW				16	1	15	3.7	1.5	4.1
	NEITHER				17	2	15	3.9	2.9	4.1

APPENDIX F

FREQUENCY ANALYSIS OF SURVEY RESPONSES

VARIABLE	QUESTION	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
			ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS101	26A		3.91	4.04	3.90						
		1				44	2	42	12.6	7.7	13.0
		2				45	4	41	12.9	15.4	12.7
		3				38	2	36	10.9	7.7	11.1
		4				76	5	71	21.7	19.2	21.9
		5				96	11	85	27.4	42.3	26.2
		6				19	0	19	5.4	0.0	5.9
		7				32	2	30	9.1	7.7	9.3
ANS102	26B		3.91	4.08	3.90						
		1				47	2	45	13.5	7.7	13.9
		2				41	2	39	11.7	7.7	12.1
		3				38	3	35	10.9	11.5	10.8
		4				79	8	71	22.6	30.8	22.0
		5				89	9	80	25.5	34.6	24.8
		6				24	0	24	6.9	0.0	7.4
		7				31	2	29	8.9	7.7	9.0

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS103	26C		4.11	4.12	4.11						
		1				32	2	30	9.2	7.7	9.3
		2				41	3	38	11.8	11.5	11.8
		3				36	0	36	10.4	0.0	11.2
		4				75	9	66	21.6	34.6	20.6
		5				102	10	92	29.4	38.5	28.7
		6				32	1	31	9.2	3.8	9.7
		7				29	1	28	8.4	3.8	8.7
ANS104	26D		4.56	4.50	4.56						
		1				21	1	20	6.0	3.8	6.2
		2				31	1	30	8.9	3.8	9.3
		3				19	1	18	5.5	3.8	5.6
		4				68	9	59	19.5	34.6	18.3
		5				119	10	109	34.2	38.5	33.9
		6				52	3	49	14.9	11.5	15.2
		7				38	1	37	10.9	3.8	11.5

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS105	26E		5.04	5.23	5.02						
		1				16	0	16	4.6	0.0	4.9
		2				15	2	13	4.3	7.7	4.0
		3				24	1	23	6.9	3.8	7.1
		4				44	2	42	12.6	7.7	13.0
		5				103	10	93	29.4	38.5	28.7
		6				82	6	76	23.4	23.1	23.5
		7				66	5	61	18.9	19.2	18.8
ANS106	26F		3.56	4.42	3.49						
		1				67	1	66	19.1	3.8	20.4
		2				46	1	45	13.1	3.8	13.9
		3				39	1	38	11.1	3.8	11.7
		4				80	11	69	22.9	42.3	21.3
		5				73	9	64	20.9	34.6	19.8
		6				29	1	28	8.3	3.8	8.6
		7				16	2	14	4.6	7.7	4.3

VARIABLE	QUESTION	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
			ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS107	26G		4.71	4.77	4.71						
		1				27	1	26	7.7	3.8	8.0
		2				16	0	16	4.6	0.0	4.9
		3				21	1	20	6.0	3.8	6.2
		4				64	7	57	18.3	26.9	17.6
		5				107	11	96	30.6	42.3	29.6
		6				68	5	63	19.4	19.2	19.4
		7				47	1	46	13.4	3.8	14.2
ANS108	26H		4.81	4.85	4.81						
		1				19	0	19	5.4	0.0	5.9
		2				18	1	17	5.1	3.8	5.2
		3				22	2	20	6.3	7.7	6.2
		4				55	6	49	15.7	23.1	15.1
		5				118	10	108	33.7	38.5	33.3
		6				74	5	69	21.1	19.2	21.3
		7				44	2	42	12.6	7.7	13.0

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS109	26I		4.78	5.00	4.76						
		1				17	0	17	4.9	0.0	5.3
		2				20	0	20	5.8	0.0	6.2
		3				13	1	12	3.7	3.8	3.7
		4				74	9	65	21.3	34.6	20.2
		5				114	9	105	32.9	34.6	32.7
		6				68	3	65	19.6	11.5	20.2
		7				41	4	37	11.8	15.4	11.5
ANS110	26J		5.19	5.42	5.18						
		1				12	0	12	3 4	0.0	3.7
		2				13	0	13	3.7	0.0	4.0
		3				20	1	19	5.7	3.8	5.9
		4				37	3	34	10.6	11.5	10.5
		5				106	12	94	30.3	46.2	29.0
		6				92	4	88	26.3	15.4	27.2
		7				70	6	64	20.0	23.1	19.8

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS111	26K		5.50	5.27	5.52						
		1				8	0	8	2.3	0.0	2.5
		2				6	1	5	1.7	3.8	1.5
		3				13	2	11	3.7	7.7	3.4
		4				41	5	36	11.7	19.2	11.1
		5				85	5	80	24.3	19.2	24.7
		6				103	7	96	29.4	26.9	29.6
		7				94	6	88	26.9	23.1	27.2
ANS112	26L		5.75	5.73	5.75						
		1				11	0	11	3.1	0.0	3.4
		2				11	0	11	3.1	0.0	3.4
		3				5	0	5	1.4	0.0	1.5
		4				28	7	21	8.0	26.9	6.5
		5				60	3	57	17.1	11.5	17.6
		6				92	6	86	26.3	23.1	26.5
		7				143	10	133	40.9	38.5	41.0

VARIABLE	QUESTION	VALUE	MEAN ALL	MEAN DCM	MEAN NONDCM	ABSOLUTE FREQUENCY ALL	ABSOLUTE FREQUENCY DCM	ABSOLUTE FREQUENCY NONDCM	ADJUSTED FREQUENCY ALL	ADJUSTED FREQUENCY DCM	ADJUSTED FREQUENCY NONDCM
ANS113	26M		5.41	5.60	5.39						
		1				10	0	10	2.9	0.0	3.1
		2				6	0	6	1.7	0.0	1.9
		3				14	1	13	4.0	4.0	4.0
		4				47	6	41	13.5	24.0	12.7
		5				87	2	85	25.1	8.0	26.4
		6				91	9	82	26.2	36.0	25.4
		7				92	7	85	26.5	28.0	26.4
ANS114	26N		4.91	5.00	4.90						
		1				16	10	16	4.6	0.0	5.0
		2				21	2	19	6.1	7.7	5.9
		3				23	3	20	6.6	11.5	6.3
		4				60	5	55	17.3	19.2	17.2
		5				87	5	82	25.1	19.2	25.6
		6				77	5	72	22.3	19.2	22.5
		7				62	6	56	17.9	23.1	17.5

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS115	26O		5.11	4.69	5.14						
		1				11	0	11	3.2	0.0	3.4
		2				13	2	11	3.7	7.7	3.4
		3				20	3	17	5.8	11.5	5.3
		4				58	8	50	16.7	30.8	15.6
		5				98	6	92	28.2	23.1	28.7
		6				75	2	73	21.6	7.7	22.7
		7				72	5	67	20.7	19.2	20.9
ANS116	26P		5.41	4.92	5.45						
		1				10	1	9	2.9	3.8	2.8
		2				13	1	12	3.7	3.8	3.7
		3				11	3	8	3.2	11.5	2.5
		4				49	5	44	14.0	19.2	13.6
		5				74	4	70	21.2	15.4	21.7
		6				91	8	83	26.1	30.8	25.7
		7				101	4	97	28.9	15.4	30.0

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS117	26Q		5.28	4.72	5.32						
		1				8	2	6	2.3	8.0	1.9
		2				8	1	7	2.3	4.0	2.2
		3				15	2	13	4.3	8.0	4.0
		4				62	6	56	17.8	24.0	17.3
		5				93	4	89	26.6	16.0	27.5
		6				81	6	75	23.2	24.0	23.1
		7				82	4	78	23.5	16.0	24.1
ANS118	26R		4.90	4.92	4.90						
		1				12	1	11	3.4	3.8	3.4
		2				14	0	14	4.0	0.0	4.3
		3				23	1	22	6.6	3.8	6.8
		4				82	7	75	23.4	26.9	23.1
		5				91	9	82	26.0	34.6	25.3
		6				74	5	69	21.1	19.2	21.3
		7				54	3	51	15.4	11.5	15.7

VARIABLE	QUESTION	VALUE	MEAN ALL	MEAN DCM	MEAN NONDCM	ABSOLUTE FREQUENCY ALL	ABSOLUTE FREQUENCY DCM	ABSOLUTE FREQUENCY NONDCM	ADJUSTED FREQUENCY ALL	ADJUSTED FREQUENCY DCM	ADJUSTED FREQUENCY NONDCM
ANS119	26S		4.91	5.19	4.89						
		1				22	0	22	6.3	0.0	6.8
		2				13	1	12	3.7	3.8	3.7
		3				21	1	20	6.0	3.8	6.2
		4				58	7	51	16.6	26.9	15.7
		5				96	4	92	27.4	15.4	28.4
		6				83	9	74	23.7	34.6	22.8
		7				57	4	53	16.3	15.4	16.4
ANS120	26T		5.12	5.23	5.11						
		1				13	0	13	3.7	0.0	4.0
		2				8	0	8	2.3	0.0	2.5
		3				14	1	13	4.0	3.8	4.0
		4				73	9	64	20.9	34.6	19.8
		5				90	4	86	25.8	15.4	26.6
		6				83	7	76	23.8	26.9	23.5
		7				68	5	63	19.5	19.2	19.5

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS121	26U		4.86	5.00	4.85						
		1				20	0	20	5.9	0.0	6.4
		2				15	1	14	4.4	4.0	4.5
		3				21	2	19	6.2	8.0	6.1
		4				59	9	50	17.4	36.0	15.9
		5				96	2	94	28.3	8.0	29.9
		6				76	6	70	22.4	24.0	22.3
		7				52	5	47	15.3	20.0	15.0
ANS122	26V		4.89	4.92	4.88						
		1				17	0	17	4.9	0.0	5.3
		2				15	1	14	4.3	3.8	4.4
		3				21	2	19	6.1	7.7	5.9
		4				65	6	59	18.8	23.1	18.4
		5				103	9	94	29.8	34.6	29.4
		6				69	5	64	19.9	19.2	20.0
		7				56	3	53	16.2	11.5	16.6

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS123	26W		4.71	4.65	4.72						
		1				18	0	18	5.1	0.0	5.6
		2				22	1	21	6.3	3.8	6.5
		3				23	3	20	6.6	11.5	6.2
		4				70	7	63	20.0	26.9	19.4
		5				105	9	96	30.0	34.6	29.6
		6				70	5	65	20.0	19.2	20.1
		7				42	1	41	12.0	3.8	12.7
ANS124	26X		5.25	5.12	5.26						
		1				11	1	10	3.1	3.8	3.1
		2				11	1	10	3.1	3.8	3.1
		3				13	0	13	3.7	0.0	4.0
		4				56	4	52	16.0	15.4	16.0
		5				92	10	82	26.3	38.5	25.3
		6				87	6	81	24.9	23.1	25.0
		7				80	4	76	22.9	15.4	23.5

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS125	26Y		5.18	4.92	5.21						
		1				13	0	13	3.7	0.0	4.0
		2				9	1	8	2.6	3.8	2.5
		3				20	2	18	5.7	7.7	5.6
		4				63	9	54	18.1	34.6	16.8
		5				76	4	72	21.8	15.4	22.4
		6				88	6	82	25.3	23.1	25.5
		7				79	4	75	22.7	15.4	23.3
ANS126	26Z		4.69	4.65	4.69						
		1				35	0	35	10.1	0.0	11.0
		2				25	1	24	7.2	3.8	7.5
		3				14	2	12	4.1	7.7	3.8
		4				70	11	59	20.3	42.3	18.5
		5				68	4	64	19.7	15.4	20.1
		6				60	7	53	17.4	26.9	16.6
		7				73	1	72	21.2	3.8	22.6

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS201	27A		2.22	2.09	2.23						
		1				47	6	41	14.0	26.1	13.1
		2				168	9	159	50.0	39.1	50.8
		3				121	8	113	36.0	34.8	36.1
ANS202	27B		2.14	2.00	2.15						
		1				66	8	58	19.6	34.8	18.5
		2				158	7	151	47.0	30.4	48.2
		3				112	8	104	33.3	34.8	33.2
ANS203	27C		1.97	1.87	1.98						
		1				90	9	81	26.8	39.1	25.9
		2				165	8	157	49.1	34.8	50.2
		3				81	6	75	24.1	26.1	24.0
ANS204	27D		1.75	1.57	1.76						
		1				126	11	115	37.6	47.8	36.9
		2				168	11	157	50.1	47.8	50.3
		3				41	1	40	12.2	4.3	12.8

VARIABLE	QUESTION	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
			ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS205	27E		1.85	1.83	1.85						
		1				84	7	77	25.0	30.4	24.6
		2				219	13	206	65.2	56.5	65.8
		3				33	3	30	9.8	13.0	9.6
ANS206	27F		2.32	2.00	2.34						
		1				22	4	18	6.5	17.4	5.7
		2				186	15	171	55.2	65.2	54.5
		3				129	4	125	38.3	17.4	39.8
ANS207	27G		1.87	1.78	1.88						
		1				79	6	73	23.6	26.1	23.4
		2				221	16	205	66.0	69.6	65.7
		3				35	1	34	10.4	4.3	10.9
ANS208	27H		1.85	1.65	1.86						
		1				88	9	79	26.2	39.1	25.2
		2				212	13	199	63.1	56.5	63.6
		3				36	1	35	10.7	4.3	11.2

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS209	27I		1.79	1.68	1.79						
		1				98	7	91	29.2	31.8	29.0
		2				212	15	197	63.1	58.2	62.7
		3				26	0	26	7.7	0.0	8.3
ANS210	27J		1.65	1.57	1.66						
		1				138	10	128	40.9	43.5	40.8
		2				178	13	165	52.8	56.5	52.5
		3				21	0	21	6.2	0.0	6.7
ANS211	27K		1.44	1.44	1.44						
		1				201	14	187	59.5	60.9	59.4
		2				124	8	116	36.7	34.8	36.8
		3				13	1	12	3.8	4.3	3.8
ANS212	27L		1.61	1.61	1.62						
		1				141	9	132	41.8	39.1	42.0
		2				185	14	171	54.9	60.9	54.5
		3				11	0	11	3.3	0.0	3.5

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS213	27M		1.78	1.83	1.78						
		1				102	5	97	30.4	21.7	31.0
		2				205	17	188	61.0	73.9	60.1
		3				29	1	28	8.6	4.3	8.9
ANS214	27N		1.76	1.52	1.78						
		1				132	12	120	39.3	52.2	38.3
		2				152	10	142	45.2	43.5	45.4
		3				52	1	51	15.5	4.3	16.3
ANS215	27O		1.79	1.70	1.80						
		1				109	9	100	32.4	39.1	31.9
		2				188	12	176	56.0	52.2	56.2
		3				39	2	37	11.6	8.7	11.8
ANS216	27P		1.71	1.65	1.71						
		1				144	9	135	42.7	39.1	43.0
		2				148	13	135	43.9	56.5	43.0
		3				45	1	44	13.4	4.3	14.0

VARIABLE	QUESTION	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
			ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS217	27Q		1.82	1.96	1.81						
		1				88	4	84	26.1	17.4	26.8
		2				223	16	207	66.2	69.6	65.9
		3				26	3	23	7.7	13.0	7.3
ANS218	27R		1.82	1.78	1.83						
		1				93	8	85	27.6	34.8	27.1
		2				211	12	199	62.6	62.2	63.4
		3				33	3	30	9.8	13.0	9.6
ANS219	27S		1.72	1.57	1.73						
		1				132	10	122	39.3	43.5	39.0
		2				167	13	154	49.7	56.5	49.2
		3				37	0	37	11.0	0.0	11.8
ANS220	27T		1.76	1.70	1.77						
		1				103	7	96	30.8	30.4	30.9
		2				207	16	191	62.0	69.6	61.4
		3				24	0	24	7.2	0.0	7.7

VARIABLE	QUESTION	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
			ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS221	27U		1.70	1.65	1.71						
		1				133	9	124	39.8	39.1	39.9
		2				167	13	154	50.0	56.5	49.5
		3				34	1	33	10.2	4.3	10.6
ANS222	27V		1.82	1.91	1.81						
		1				102	6	96	30.5	26.1	30.9
		2				190	13	177	56.9	56.5	56.9
		3				42	4	38	12.6	17.4	12.2
ANS223	27W		1.85	1.74	1.86						
		1				88	6	82	26.3	26.1	26.3
		2				210	17	193	62.7	73.9	61.9
		3				37	0	37	11.0	0.0	11.9
ANS224	27X		1.67	1.65	1.67						
		1				133	9	124	39.6	39.1	39.6
		2				180	13	167	53.6	56.5	53.4
		3				23	1	22	6.8	4.3	7.0

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS225	27Y		1.63	1.57	1.64						
		1				142	10	132	42.5	43.5	42.4
		2				173	13	160	51.8	56.5	51.4
		3				19	0	19	5.7	0.0	6.1
ANS226	27Z		1.91	1.96	1.90						
		1				90	4	86	26.7	17.4	27.4
		2				189	16	173	56.1	69.6	55.1
		3				58	3	55	17.2	13.0	17.5

VARIABLE	QUESTION	VALUE	MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
			ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS301	28A		4.13	4.73	4.08						
		1				28	0	28	8.0	0.0	8.7
		2				33	2	31	9.5	7.7	9.6
		3				69	3	66	19.8	11.5	20.5
		4				44	4	40	12.6	15.4	12.4
		5				104	9	95	29.9	34.6	29.5
		6				49	7	42	14.1	26.9	13.0
		7				21	1	20	6.0	3.8	6.2
ANS302	28B		4.21	4.19	4.22						
		1				23	0	23	6.6	0.0	7.2
		2				36	4	32	10.4	15.4	10.0
		3				47	5	42	13.5	19.2	13.1
		4				101	9	92	29.1	34.6	28.7
		5				57	1	56	16.4	3.8	17.4
		6				44	4	40	12.7	15.4	12.5
		7				39	3	36	11.2	11.5	11.2

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS303	28C		4.26	3.89	4.29						
		1				40	4	36	11.6	15.4	11.2
		2				33	2	31	9.5	7.7	9.7
		3				36	4	32	10.4	15.4	10.0
		4				74	6	68	21.4	23.1	21.3
		5				61	5	56	17.6	19.2	17.5
		6				55	3	52	15.9	11.5	16.2
		7				47	2	45	13.6	7.7	14.1
ANS304	28D		4.21	3.19	4.29						
		1				79	7	72	22.6	26.9	22.3
		2				41	8	33	11.7	30.8	10.2
		3				31	3	28	8.9	11.5	8.7
		4				19	0	19	5.4	0.0	5.9
		5				41	2	39	11.7	7.7	12.1
		6				33	1	32	9.5	3.8	9.9
		7				105	5	100	30.1	19.2	31.0

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS305	28E		3.86	4.12	3.84						
		1				49	3	46	14.1	11.5	14.3
		2				45	1	44	13.0	3.8	13.7
		3				59	5	54	17.0	19.2	16.8
		4				71	8	63	20.5	30.8	19.6
		5				44	2	42	12.7	7.7	13.1
		6				35	4	31	10.1	15.4	9.7
		7				44	3	41	12.7	11.5	12.8
ANS306	28F		3.47	3.69	3.45						
		1				57	4	53	16.4	15.4	16.5
		2				47	3	44	13.5	11.5	13.7
		3				85	3	82	24.5	11.5	25.5
		4				70	10	60	20.2	38.5	18.7
		5				39	2	37	11.2	7.7	11.5
		6				21	1	20	6.1	3.8	6.2
		7				28	3	25	8.1	11.5	7.8

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS307	29A		2.55	2.50	2.55						
		1				181	23	158	33.2	28.7	33.9
		2				133	23	110	24.4	28.7	23.6
		3				110	19	91	20.1	23.8	19.5
		4				39	6	33	7.1	7.5	7.1
		5				54	6	48	9.9	7.5	10.3
		6				16	1	15	2.9	1.2	3.2
		7				13	2	11	2.4	2.5	2.4
ANS308	29B		5.93	5.93	5.93						
		1				5	1	4	0.9	1.2	0.9
		2				12	2	10	2.2	2.5	2.1
		3				8	1	7	1.5	1.2	1.5
		4				23	5	18	4.2	6.3	3.9
		5				118	17	101	21.6	21.3	21.6
		6				157	17	140	28.7	21.3	30.0
		7				224	37	187	41.0	46.3	40.0

VARIABLE	QUESTION	VALUE	MEAN ALL	MEAN DCM	MEAN NONDCM	ABSOLUTE FREQUENCY ALL	ABSOLUTE FREQUENCY DCM	ABSOLUTE FREQUENCY NONDCM	ADJUSTED FREQUENCY ALL	ADJUSTED FREQUENCY DCM	ADJUSTED FREQUENCY NONDCM
ANS309	29C		4.40	4.63	4.36						
		1				53	4	49	9.7	5.0	10.5
		2				48	9	39	8.8	11.2	8.2
		3				50	6	44	9.1	7.5	9.4
		4				90	10	80	16.5	12.5	17.1
		5				145	26	119	26.5	32.5	25.5
		6				106	15	91	19.4	18.8	19.5
		7				55	10	45	10.1	12.5	9.6
ANS310	29D		6.07	6.13	6.06						
		1				7	0	7	1.3	0.0	1.5
		2				9	1	8	1.6	1.2	1.7
		3				7	3	4	1.3	3.8	0.9
		4				37	2	35	6.8	2.5	7.5
		5				74	13	61	13.5	16.2	13.1
		6				137	21	116	25.0	26.3	24.8
		7				276	40	236	50.5	50.0	50.5

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS311	29E		2.74	2.34	2.81						
		1				173	30	143	31.7	38.0	30.7
		2				126	24	102	23.1	30.4	21.9
		3				83	8	75	15.2	10.1	16.1
		4				67	10	57	12.3	12.7	12.2
		5				51	2	49	9.4	2.5	10.5
		6				19	2	17	3.5	2.5	3.6
		7				26	3	23	4.8	3.8	4.9
ANS312	29F		2.39	2.29	2.41						
		1				187	29	158	34.2	36.2	33.8
		2				140	23	117	25.6	28.7	25.1
		3				116	17	99	21.2	21.3	21.2
		4				60	3	57	11.0	3.8	12.2
		5				21	4	17	3.8	5.0	3.6
		6				13	3	10	2.4	3.8	2.1
		7				10	1	9	1.8	1.2	1.9

VARIABLE	QUESTION	VALUE	MEAN ALL	MEAN DCM	MEAN NONDCM	ABSOLUTE FREQUENCY ALL	ABSOLUTE FREQUENCY DCM	ABSOLUTE FREQUENCY NONDCM	ADJUSTED FREQUENCY ALL	ADJUSTED FREQUENCY DCM	ADJUSTED FREQUENCY NONDCM
ANS313	29G		5.78	5.48	5.83						
		1				5	1	4	0.9	1.2	0.9
		2				8	4	4	1.5	5.0	0.9
		3				12	2	10	2.2	2.5	2.1
		4				57	12	45	10.4	15.0	9.7
		5				110	15	95	20.1	18.8	20.4
		6				159	22	137	29.1	27.5	29.4
		7				195	24	171	35.7	30.0	36.7
ANS314	29H		4.82	4.69	4.85						
		1				28	4	24	5.1	5.0	5.1
		2				37	4	33	6.8	5.0	7.1
		3				69	13	56	12.6	16.2	12.0
		4				66	9	57	12.1	11.2	12.2
		5				123	23	100	22.5	28.7	21.4
		6				118	16	102	21.6	20.0	21.8
		7				106	11	95	19.4	13.8	20.3

VARIABLE	QUESTION	VALUE	MEAN ALL	MEAN DCM	MEAN NONDCM	ABSOLUTE FREQUENCY ALL	ABSOLUTE FREQUENCY DCM	ABSOLUTE FREQUENCY NONDCM	ADJUSTED FREQUENCY ALL	ADJUSTED FREQUENCY DCM	ADJUSTED FREQUENCY NONDCM
ANS315	29I		5.11	4.90	5.14						
		1				10	2	8	1.8	2.5	1.7
		2				27	4	23	4.9	5.0	4.9
		3				55	10	45	10.1	12.5	9.7
		4				55	10	45	10.1	12.5	9.7
		5				168	25	143	30.8	31.3	30.7
		6				117	16	101	21.4	20.0	21.7
		7				114	13	101	20.9	16.2	21.7
ANS316	29J		3.69	3.75	3.68						
		1				62	8	54	11.4	10.0	11.6
		2				61	7	54	11.2	8.7	11.6
		3				85	19	66	15.6	23.8	14.2
		4				180	19	161	33.1	23.8	34.7
		5				102	19	83	18.8	23.8	17.9
		6				40	6	34	7.4	7.5	7.3
		7				14	2	12	2.6	2.5	2.6

VARIABLE	QUESTION	VALUE	MEAN ALL	MEAN DCM	MEAN NONDCM	ABSOLUTE FREQUENCY ALL	ABSOLUTE FREQUENCY DCM	ABSOLUTE FREQUENCY NONDCM	ADJUSTED FREQUENCY ALL	ADJUSTED FREQUENCY DCM	ADJUSTED FREQUENCY NONDCM
ANS317	29K		3.22	2.74	3.30						
		1				101	23	78	19.0	29.5	17.2
		2				100	18	82	18.8	23.1	18.1
		3				93	12	81	17.5	15.4	17.8
		4				130	15	115	24.4	19.2	25.3
		5				53	4	49	10.0	5.1	10.8
		6				36	3	33	6.8	3.8	7.3
		7				19	3	16	3.6	3.8	3.5
ANS318	29L		4.85	4.14	4.98						
		1				19	6	13	3.5	7.5	2.8
		2				37	10	27	6.8	12.5	5.8
		3				34	8	26	6.3	10.0	5.6
		4				148	24	124	27.2	30.0	26.7
		5				101	14	87	18.6	17.5	18.8
		6				87	11	76	16.0	13.8	16.4
		7				118	7	111	21.7	8.7	23.9

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS319	29M		3.92	3.86	3.93						
		1				52	8	44	9.6	10.0	9.5
		2				73	13	60	13.4	16.2	13.0
		3				114	16	98	21.0	20.0	21.2
		4				66	9	57	12.2	11.2	12.3
		5				132	17	115	24.3	21.9	24.8
		6				76	13	63	14.0	16.2	13.6
		7				30	4	26	5.5	5.0	5.6
ANS320	29N		3.69	3.79	3.67						
		1				59	8	51	10.8	10.0	11.0
		2				70	11	59	12.8	13.8	12.7
		3				92	14	78	16.9	17.5	16.8
		4				163	15	148	29.9	18.8	31.8
		5				67	23	74	17.8	28.7	15.9
		6				49	7	42	9.0	8.7	9.0
		7				15	2	13	2.8	2.5	2.8

			MEAN			ABSOLUTE FREQUENCY			ADJUSTED FREQUENCY		
VARIABLE	QUESTION	VALUE	ALL	DCM	NONDCM	ALL	DCM	NONDCM	ALL	DCM	NONDCM
ANS321	29O		4.63	4.66	4.62						
		1				43	7	36	7.9	8.7	7.7
		2				41	4	37	7.5	5.0	8.0
		3				44	7	37	8.1	8.7	8.0
		4				64	7	57	11.7	8.7	12.3
		5				175	31	144	32.1	38.7	31.0
		6				113	14	99	20.7	17.5	21.3
		7				65	10	55	11.9	12.5	11.8
ANS322	29P		2.71	2.49	2.75						
		1				133	25	108	24.4	31.3	23.2
		2				152	22	130	27.9	27.5	28.0
		3				110	17	93	20.2	21.3	20.0
		4				71	5	66	13.0	6.3	14.2
		5				51	7	44	9.4	8.7	9.5
		6				25	4	21	4.6	5.0	4.5
		7				33	0	33	0.6	0.0	0.6

APPENDIX G

SIGNIFICANT CONTINGENCY TABLE CHI-SQUARE RESULTS FOR ALL RESPONDENTS

	ANS101	ANS102	ANS103	ANS104	ANS105	ANS106	ANS107	ANS108	ANS109	ANS110	ANS111	ANS112	ANS113	ANS114	ANS115	ANS116	ANS117	ANS118	ANS119	ANS120	ANS121	ANS122	ANS123	ANS124	ANS125	ANS126
RANK	X											X											X			X
TAFCS	X	X															X						X			X
SEX							X				X															X
AGE		X																					X			
DEGREE						X																				
MAJOR																										
MAJCON								X																		
OTHCMD						X																				X
LVLCMD								X																		
ENTRY																										
ENLIST	X																									
YRSEXP												X					X					X	X	X		
MXUNIT											X	X	X										X			
ORGN																	X	X					X			
SHIFT	X	X											X	X				X				X				
DEPLOY		X													X											
MOR													X			X			X		X				X	
TECH											X			X	X	X					X					
FTD									X			X														X

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS201	ANS202	ANS203	ANS204	ANS205	ANS206	ANS207	ANS208	ANS209	ANS210	ANS211	ANS212	ANS213	ANS214	ANS215	ANS216	ANS217	ANS218	ANS219	ANS220	ANS221	ANS222	ANS223	ANS224	ANS225	ANS226
RANK	X	X	X										X													
TAFCS	X	X	X											X											X	
SEX	X			X						X													X		X	
AGE	X	X	X											X							X					
DEGREE		X	X																							
MAJOR																					X					
MAJCON	X	X	X															X	X	X	X					
OTHCMB	X	X						X						X												
LVLCMB	X	X	X																							
ENTRY														X												
ENLIST				X																						
YRSEXP		X																								
MXUNIT			X															X		X	X					
ORGN																	X		X							
SHIFT														X												
DEPLOY		X																								
MGR																										
TECH																										
FTD					X																					

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS301	ANS302	ANS303	ANS304	ANS305	ANS306	ANS307	ANS308	ANS309	ANS310	ANS311	ANS312	ANS313	ANS314	ANS315	ANS316	ANS317	ANS318	ANS319	ANS320	ANS321	ANS322
RANK		X		X			X				X	X	X			X	X	X		X		
TAFCS		X		X		X	X						X					X				
SEX		X		X						X		X						X	X		X	
AGE		X		X							X		X									
DEGREE				X						X					X				X			
MAJOR																						
MAJCDN	X																	X				
OTHCMB				X											X	X				X		
LVLCMB																						
ENTRY		X													X			X		X		
ENLIST					X	X				X											X	X
YRSEXP		X		X												X			X		X	
MXUNIT												X										
ORGN		X																				
SHIFT							X		X		X					X				X		
DEPLOY								X				X					X					
MGR							X			X	X											
TECH						X	X		X	X		X		X				X				
FTD													X			X						

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	RANK	TAFCS	SEX	AGE	DEGREE	MAJOR	MAJCOM	OTHCMD	LVLCMD	ENTRY	EMLIST	YRSEXP	MXUNIT	ORGN	SHIFT	DEPLOY	FTD
MGR								X						X	X		
TECH	X						X		X					X	X	X	
CNT1	X	X									X						
CNT2		X			X		X		X			X	X	X	X		
CNT3							X							X			
RANK					X			X	X	X			X				
SEX	X	X															X
FTD	X					X			X					X			

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

APPENDIX H

SIGNIFICANT ANOVA RESULTS FOR ALL RESPONDENTS

	ANS101	ANS102	ANS103	ANS104	ANS105	ANS106	ANS107	ANS108	ANS109	ANS110	ANS111	ANS112	ANS113	ANS114	ANS115	ANS116	ANS117	ANS118	ANS119	ANS120	ANS121	ANS122	ANS123	ANS124	ANS125	ANS126
RANK	X	X	X			X								X					X	X			X		X	
TAFCS	X	X	X			X								X									X		X	
SEX	X						X				X	X					X					X				
AGE	X	X				X													X	X	X	X	X	X	X	
DEGREE			X			X													X				X		X	
MAJOR																										
MAJCOM			X					X		X		X											X			
OTHCMD	X	X				X	X	X											X				X			X
LVLCMD																							X			
ENTRY																										
ENLIST																										
YRSEXP	X	X					X					X					X								X	
MXUNIT					X					X	X	X														
ORGN																					X		X			X
SHIFT	X																	X								
DEPLOY															X								X	X	X	
MGR																										
TECH														X												X
FTD					X						X															

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS2201	ANS2202	ANS2203	ANS2204	ANS2205	ANS2206	ANS2207	ANS2208	ANS2209	ANS2210	ANS2211	ANS2212	ANS2213	ANS2214	ANS2215	ANS2216	ANS2217	ANS2218	ANS2219	ANS2220	ANS2221	ANS2222	ANS2223	ANS2224	ANS2225	ANS2226
RANK	X	X	X											X					X							
TAFCB	X	X	X	X										X												
SEX	X	X	X	X						X						X						X			X	
AGE	X	X	X																							
DEGREE	X	X	X																							
MAJOR																										
MAJCOM		X	X	X															X	X	X	X				
OTHCMD		X				X								X												
LVLCMD	X	X	X																							
ENTRY														X												
ENLIST		X		X																						
YRSEXP	X	X										X														
MXUMIT		X	X																X		X					
ORGN																	X		X							X
SHIFT																										
DEPLOY		X																								
MGR														X												
TECH												X														X
FTD																										

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS301	ANS302	ANS303	ANS304	ANS305	ANS306	ANS307	ANS308	ANS309	ANS310	ANS311	ANS312	ANS313	ANS314	ANS315	ANS316	ANS317	ANS318	ANS319	ANS320	ANS321	ANS322
RANK		X		X			X				X		X	X	X		X	X	X			
TAFCS	X	X		X			X				X		X	X	X		X	X				
SEX	X	X		X	X						X		X		X			X	X		X	
AGE	X	X		X							X		X		X		X	X	X		X	
DEGREE									X						X			X				
MAJOR										X	X										X	
MAJCOM																				X		
OTHCMD	X	X		X			X								X							
LVLCMD																		X				
ENTRY		X								X	X		X		X			X				
ENLIST																					X	X
YRSEXP		X		X						X					X				X		X	
MXUNIT		X							X			X						X				
ORGN		X								X					X							
SHIFT									X		X									X		
DEPLOY																	X					
MGR																						
TECH			X	X			X				X	X		X				X				
FID													X					X				

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	RANK	TAFCS	SEX	AGE	DEGREE	MAJOR	MAJCOM	OTHCMD	LVLCMD	ENTRY	ENLIST	YRSEXP	MXUNIT	ORGN	SHIFT	DEPLOY	FTD
MGR	X	X		X				X						X	X		
TECH	X	X		X			X			X					X	X	
CMT1																	
CMT2	X			X						X		X	X	X			
CMT3										X							
RANK					X			X	X	X	X		X				
SEX	X	X											X				X
FTD	X						X		X	X							

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

APPENDIX I

SIGNIFICANT CONTINGENCY TABLE CHI-SQUARE RESULTS FOR DCM RESPONDENTS

	ANS101	ANS102	ANS103	ANS104	ANS105	ANS106	ANS107	ANS108	ANS109	ANS110	ANS111	ANS112	ANS113	ANS114	ANS115	ANS116	ANS117	ANS118	ANS119	ANS120	ANS121	ANS122	ANS123	ANS124	ANS125	ANS126
RANK					X				X	X	X								X				X			
TAFCS										X	X					X		X	X		X	X	X		X	
SEX																										
AGE					X																					
DEGREE																										
MAJOR			X																							
MAJCOM						X												X								
OTHCMD												X	X		X						X				X	
LVLCMD			X			X																				
ENTRY																										X
ENLIST								X	X	X																
YRSEXP														X												
MXUNIT						X																				
ORGN					X				X	X																
SHIFT																										
DEPLOY																										
MBR																										
TECH						X										X	X							X		
FTD										X			X				X									

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS201	ANS202	ANS203	ANS204	ANS205	ANS206	ANS207	ANS208	ANS209	ANS210	ANS211	ANS212	ANS213	ANS214	ANS215	ANS216	ANS217	ANS218	ANS219	ANS220	ANS221	ANS222	ANS223	ANS224	ANS225	ANS226
RANK										X																
TAFCS																										
SEX																										
AGE																										
DEGREE		X																								
MAJOR																										
MAJCON													X								X				X	
OTHCMD														X			X									
LVLCMD																										
ENTRY								X																X		
ENLIST																		X		X						
YRSEXP																										
MXUNIT														X												
ORGN																										
SHIFT																										
DEPLOY																										
MGR																				X						
TECH											X															
FTD																										

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS301	ANS302	ANS303	ANS304	ANS305	ANS306	ANS307	ANS308	ANS309	ANS310	ANS311	ANS312	ANS313	ANS314	ANS315	ANS316	ANS317	ANS318	ANS319	ANS320	ANS321	ANS322
RANK																X	X					
TAFCS																X	X					
SEX																						
AGE		X		X													X					
DEGREE																						
MAJOR																						
MAJCOM									X	X				X	X		X		X			
OTHCMD																				X		
LVLCMD																						
ENTRY																		X				X
ENLIST																					X	
YRSEXP															X							
MXUNIT																						
ORGN																			X			
SHIFT																						
DEPLOY												X										
MGR												X				X						
TECH																						
FTD									X					X								

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	RANK	TAFCS	SEX	AGE	DEGREE	MAJOR	MAJCOM	OTHCMD	LVLCMD	ENTRY	ENLIST	YRSEXP	MXUNIT	ORGN	SHIFT	DEPLOY	FTD
MBR														X			
TECH	X			X													
CMT1													X				
CMT2																	
CMT3														X			
RANK					X				X	X	X		X				
SEX																	
FTD	X																

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

APPENDIX J

SIGNIFICANT ANOVA RESULTS FOR DCM RESPONDENTS

	ANS101	ANS102	ANS103	ANS104	ANS105	ANS106	ANS107	ANS108	ANS109	ANS110	ANS111	ANS112	ANS113	ANS114	ANS115	ANS116	ANS117	ANS118	ANS119	ANS120	ANS121	ANS122	ANS123	ANS124	ANS125	ANS126
RANK									X	X																
TAFCS									X	X	X			X				X	X			X	X			
SEX																										
AGE																										
DEGREE																										
MAJOR																										
MAJCOM									X	X									X							
OTHCMD						X										X								X	
LVLCMD																										
ENTRY																										
ENLIST																										
YRSEXP											X		X	X				X						X		
MXUNIT																										
ORGN							X		X	X			X													
SHIFT																										
DEPLOY																										
MGR													X	X			X									
TECH						X							X			X	X							X		
FTD													X									X	X			

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS201	ANS202	ANS203	ANS204	ANS205	ANS206	ANS207	ANS208	ANS209	ANS210	ANS211	ANS212	ANS213	ANS214	ANS215	ANS216	ANS217	ANS218	ANS219	ANS220	ANS221	ANS222	ANS223	ANS224	ANS225	ANS226
RANK										X																
TAFCS																										
SEX																										
AGE																									X	
DEGREE																								X		
MAJOR																									X	
MAJCOM			X											X												X
OTHCMD																										
LVLCMD																								X		
ENTRY																			X							
ENLIST																										
YRSEXP					X																					
MXUNIT										X															X	
ORGN																										
SHIFT	X																			X						
DEPLOY																										
MGR																										
TECH																										
FID																										

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS301	ANS302	ANS303	ANS304	ANS305	ANS306	ANS307	ANS308	ANS309	ANS310	ANS311	ANS312	ANS313	ANS314	ANS315	ANS316	ANS317	ANS318	ANS319	ANS320	ANS321	ANS322
RANK																						
TAFCB																						
SEX																						
AGE																						
DEGREE																						
MAJOR																						
MAJCOM							X		X	X		X					X					
OTHCMD										X										X		
LVLCMD																						
ENTRY																				X	X	
ENLIST	X																					
YRSEXP															X							
MXUNIT																						
ORGN			X																X			
SHIFT									X							X		X		X		
DEPLOY			X																			
MGR												X										
TECH																						
FTD																						

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	RANK	TAFCS	SEX	AGE	DEGREE	MAJOR	MAJCOM	OTHCMD	LVLCMD	ENTRY	ENLIST	YRSEXP	MXUNIT	ORGN	SHIFT	DEPLOY	FTD
MGR								X									
TECH	X	X										X					
CNT1					X												
CNT2																	
CNT3																	
RANK					X					X	X		X				
SEX																	
FTD	X																

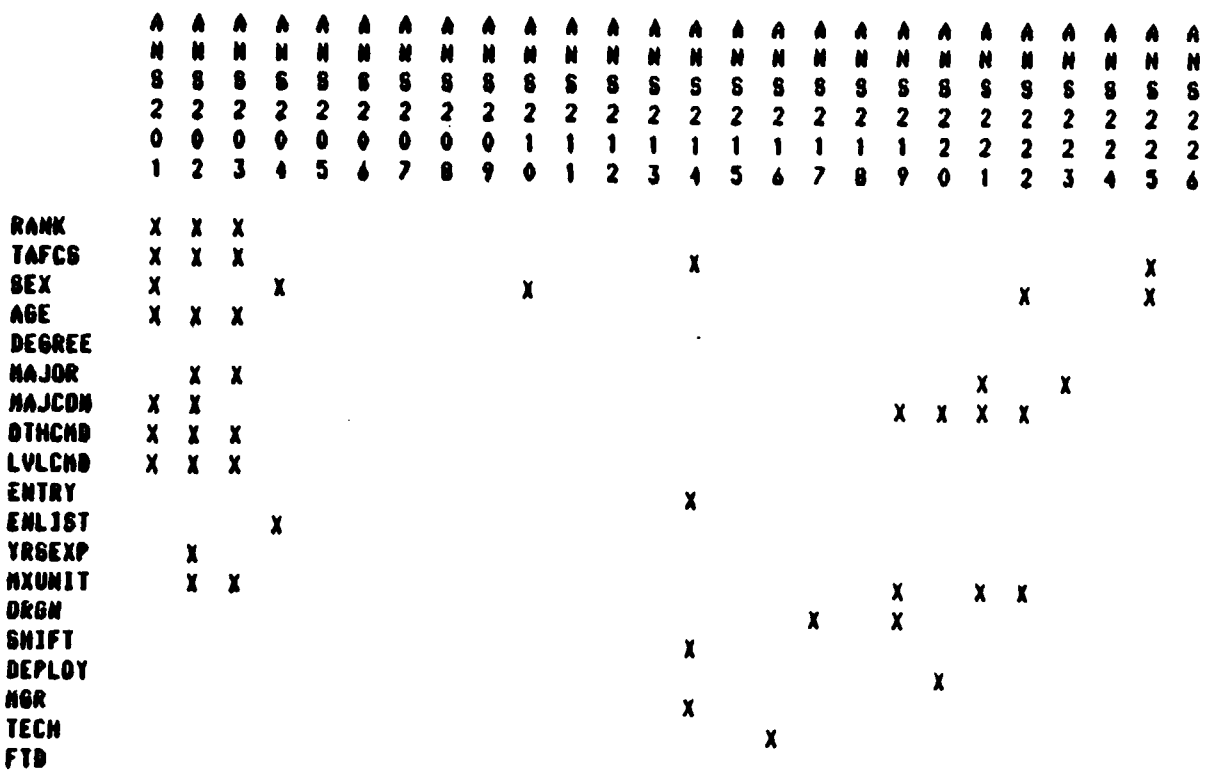
NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

APPENDIX K

SIGNIFICANT CONTINGENCY TABLE CHI-SQUARE RESULTS FOR NON-DCM RESPONDENTS

	ANS101	ANS102	ANS103	ANS104	ANS105	ANS106	ANS107	ANS108	ANS109	ANS110	ANS111	ANS112	ANS113	ANS114	ANS115	ANS116	ANS117	ANS118	ANS119	ANS120	ANS121	ANS122	ANS123	ANS124	ANS125	ANS126
RANK	X	X	X									X											X			X
TAFCS	X	X	X												X		X								X	X
SEX											X															
AGE		X																						X		
DEGREE						X																				
MAJOR																										
MAJCOM								X																		
OTHCMD																										X
LVLCMD								X																		
ENTRY	X																									
ENLIST	X																									
YRSEXP												X					X					X		X		
MXUNIT	X										X	X	X										X			
ORGN																	X	X			X		X			
SHIFT	X												X	X				X				X				
DEPLOY		X													X								X			
MGR													X			X			X	X	X				X	
TECH											X			X	X						X					
FTD									X			X														X

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.



NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS301	ANS302	ANS303	ANS304	ANS305	ANS306	ANS307	ANS308	ANS309	ANS310	ANS311	ANS312	ANS313	ANS314	ANS315	ANS316	ANS317	ANS318	ANS319	ANS320	ANS321	ANS322
RANK		X		X			X				X		X	X				X				
TAFCS		X					X						X					X				
SEX		X		X								X						X	X		X	
AGE		X		X							X											
DEGREE										X					X				X			
MAJOR										X												
MAJCOM																						
DTWCMD				X									X		X	X						
LVLCMD																						
ENTRY		X								X					X			X				
ENLIST				X	X	X				X											X	
YRSEXP		X		X							X		X			X	X		X	X	X	
MXUNIT												X				X						
ORGN		X													X							
SHIFT									X		X					X					X	
DEPLOY								X				X				X	X					
MGR							X			X	X											X
TECH					X		X		X	X		X		X				X		X		
FTD																X						

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	RANK	TAFCS	SEX	AGE	DEGREE	NAJCOR	MAJCOM	OTHCMD	LVLCMD	ENTRY	ENLIST	YRSEXP	MXUNIT	ORGN	SHIFT	DEPLOY	FTD
MGR	X							X							X		
TECH							X							X	X	X	
CNT1	X	X										X					
CNT2	X	X			X		X		X	X		X		X	X		
CNT3							X			X				X			
RANK					X			X	X	X	X		X				
SEX	X	X															X
FTD	X						X		X					X			

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

APPENDIX L

SIGNIFICANT ANOVA RESULTS FOR NON-DCM RESPONDENTS

	ANS101	ANS102	ANS103	ANS104	ANS105	ANS106	ANS107	ANS108	ANS109	ANS110	ANS111	ANS112	ANS113	ANS114	ANS115	ANS116	ANS117	ANS118	ANS119	ANS120	ANS121	ANS122	ANS123	ANS124	ANS125	ANS126
RANK	X	X	X											X									X		X	
TAFCS	X	X	X			X					X												X		X	
SEX	X						X				X	X					X					X				
AGE	X	X																				X	X	X	X	
DEGREE			X			X													X	X			X		X	
MAJOR																										
MAJCOM			X					X				X	X										X			
OTHCMD	X	X	X			X		X				X														X
LVLCMD																							X			
ENTRY																										
ENLIST																										
YRSEXP		X					X					X					X									
MXUNIT					X						X	X	X													X
ORGN																	X						X			
SHIFT	X																	X								
DEPLOY															X	X							X	X		
MGR									X				X	X							X					
TECH														X												X
FID					X							X														

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS201	ANS202	ANS203	ANS204	ANS205	ANS206	ANS207	ANS208	ANS209	ANS210	ANS211	ANS212	ANS213	ANS214	ANS215	ANS216	ANS217	ANS218	ANS219	ANS220	ANS221	ANS222	ANS223	ANS224	ANS225	ANS226
RANK	X	X	X																		X					
TAFCS	X	X	X	X										X												
SEX	X	X	X	X						X						X						X			X	
AGE	X	X	X																							
DEGREE	X	X	X																							
MAJOR																										
MAJCON	X	X	X							X									X	X	X	X				
OTHCNB	X	X	X			X																				
LVLCNB	X	X	X																							
ENTRY														X												
ENLIST		X		X																						
YRSEXP	X	X										X														
MXUNIT		X	X																X		X					
ORGN																	X		X				X			X
SHIFT																										
DEPLOY		X																								
MGR														X												
TECH												X													X	X
FTB																										

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	ANS301	ANS302	ANS303	ANS304	ANS305	ANS306	ANS307	ANS308	ANS309	ANS310	ANS311	ANS312	ANS313	ANS314	ANS315	ANS316	ANS317	ANS318	ANS319	ANS320	ANS321	ANS322
RANK		X		X			X				X		X	X	X			X	X	X		
TAFCS	X	X		X			X				X		X	X	X			X				
SEX	X	X		X	X						X		X		X			X	X		X	
AGE		X		X							X		X		X			X	X		X	
DEGREE															X			X				
MAJOR										X	X											
MAJCON																						
OTHCMB				X			X				X		X		X							
LVLCMB																						
ENTRY										X					X			X				
ENLIST																					X	
YRSEXP		X		X						X	X				X						X	
MXUNIT		X			X				X			X										
ORGN		X													X							
SHIFT																				X		
DEPLOY																	X					
MGR							X				X											
TECH							X				X	X	X	X				X				
FTD																		X				

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

	RANK	TAFCS	SEX	AGE	DEGREE	MAJOR	NAVCOM	OTHCMD	LVLCMD	ENTRY	ENLIST	YRSEXP	MXUNIT	ORGN	SHIFT	DEPLOY	FTD
MGR	X	X		X			X	X						X	X		
TECH	X	X					X								X	X	
CMT1			X														
CMT2	X			X						X		X	X	X			
CMT3										X				X			
RANK					X			X	X	X	X		X				
SEX	X	X											X				X
FTD	X						X										

NOTE: AN 'X' INDICATES THAT A SIGNIFICANT RELATIONSHIP EXISTS BETWEEN THE VARIABLE IN THE LEFT COLUMN AND THE VARIABLE ABOVE. THE LEVEL OF CONFIDENCE FOR ALL SUCH RELATIONSHIPS IS 95 PERCENT OR ABOVE.

APPENDIX M

EXCERPTS FROM AFR 36-1

Introduction

AIRCRAFT MAINTEN...E AND MUNITIONS UTILIZATION FIELD (40)

1. The Aircraft Maintenance and Munitions Utilization Field encompasses the functions of program formulation, policy planning, production management, quality control, inspection, and direction of aircraft maintenance, avionics, and munitions activities. This field includes immediate supervisory and technical responsibilities for the removal, installation, modification, calibration, repair, and storage of aircraft, avionics, and munitions equipment and components. This includes aircraft engines, airframes, accessories, instruments, and aerospace ground equipment; aircraft systems and equipment to include hydraulic, mechanical, electrical, and fuel systems; bomb-navigation, offensive and defensive fire control, weapons control, air launched missile control and guidance, AIM, and electronic countermeasures equipment and monitor systems; manufacturing and shop equipment; photographic equipment; optical, reconnaissance, and cartographic sensors, infrared systems, television and laser systems, and associated computer systems; and air launch missile propulsion systems, aerospace munitions, release, launch, suspension, and monitor systems. Also included are the immediate supervisory and technical responsibilities for assembly, checkout, loading, maintenance, modification, and disposal of nuclear, explosive, toxic, chemical-biological, and incendiary aerospace munitions including bombs, warheads, mines, guided aircraft missiles and rockets, reentry vehicles, solid propellants, and ammunition; training in aerial bombing, gunnery, rocketry and missilery; advising on installations defense, disaster preparedness, and tactical employment of aerospace munitions.

2. Excluded from this utilization field are the functions of maintaining Intercontinental Ballistic Missiles except maintenance of reentry vehicles. The excluded functions are included in the Missile Maintenance Utilization Field.

AFSC 4016
Entry AFSC 4011

OFFICER AIR FORCE SPECIALTY

MAINTENANCE STAFF OFFICER

1. SPECIALTY SUMMARY

Administers and manages maintenance activities for assigned primary maintenance (aircraft, avionics, and munitions) programs including related support equipment and facilities; and commands aircraft, avionics, and munitions maintenance units.

2. DUTIES AND RESPONSIBILITIES

a. *Formulates maintenance plans and policies.* Determines personnel and materiel support for current and projected maintenance activities for aircraft, avionics, and munitions requirements. Determines requirements for facility support of the maintenance of primary mission equipment. Establishes overall standards of performance for organizational, intermediate, and depot maintenance activities. Plans and schedules replacement and improvement of facilities based on availability of resources and requirements for increased or changed service. Plans modification and modernization of primary mission equipment and supporting equipment. Formulates policies, concepts, and procedures to insure effective and efficient use of personnel, equipment, facilities, and management systems. Defines technical problems and economic factors related to research and development and system application.

b. *Coordinates maintenance activities.* Manages and/or commands maintenance activities and insures interface with other base, depot, and higher headquarters activities. Consults and advises personnel staffs on the use of personnel. Maintains liaison with supply staffs to insure availability of supplies to support present and projected plans. Coordinates with, and may manage the efforts of, staff and operating activities to determine effectiveness of newly adopted techniques for maintenance equipment, programs, and systems. Maintains cognizance of and liaison with research and development efforts in the primary mission equipment areas to keep abreast of technological improvements in primary mission equipment, support equipment, and management techniques. Manages technical escort activities when assigned a chemical munition support mission.

c. *Directs and monitors maintenance activities.* Conducts inspections and evaluations of training programs, condition of facilities, operational readiness and effectiveness of maintenance units/activities. Reviews maintenance and operational data to evaluate programs, determine trends, project requirements, and improve maintenance effectiveness. Directs preparation of budget estimates and approves the expenditure of funds for procurement, installation, operation, and maintenance of equipment and for leased commercial facilities. Prepares or directs preparation of publications, including policy, procedures, technical and operating directives affecting maintenance functions. Conducts or participates in working groups involving developing systems, management endeavors, etc. Takes follow up actions with functional management activities to insure attainment of management objectives. Prepares maintenance annexes to operational plans, commander estimates of situation, and operations orders.

3. SPECIALTY QUALIFICATIONS

a. *Knowledge:*

(1) Knowledge of maintenance management, maintenance control, maintenance information systems, and financial management; and the interfaces with supply, transportation, and POL support operations as related to maintenance units is mandatory.

(2) Knowledge of the capabilities, limitation, and employment of mission equipment in one of the primary maintenance areas is mandatory.

(3) Knowledge of the capabilities, limitation, and employment of mission equipment in all three primary maintenance areas is desirable.

b. *Education.* Master's degree, preferably in management or logistics, is desirable.

c. *Experience.* Full qualification as an Aircraft Maintenance Officer or a Munitions Officer is mandatory. In addition, a minimum of 18 months' experience in Maintenance Staff Officer duties involving planning, coordinating, and directing activities such as maintenance, modification, and repair in one of the

primary maintenance areas is mandatory.

d. *Training:*

(1) Completion of an entry level integrated maintenance officer course is mandatory.

(2) Completion of the maintenance staff officer course is desirable.

(3) Completion of staff level professional military education is desirable.

4. SPECIALTY DATA

a. *Grade Spread.* Major through colonel.

b. *Related D.O.T. Jobs:*

Manager, Industrial Organization	189.118
Industrial/Management	
Engineer	012.188
Director, Quality Control	012.168

c. *Related DOD Occupational Group:* 4D

AFSC 4024
Entry AFSC 4021

OFFICER AIR FORCE SPECIALTY

AIRCRAFT MAINTENANCE OFFICER

1. SPECIALTY SUMMARY

Manages aircraft maintenance activities, including field, avionic, and organizational maintenance functions; the removal, repair, inspection, overhaul, and modification of aircraft, avionic, and associated ground equipment; and commands aircraft/avionics maintenance units.

2. DUTIES AND RESPONSIBILITIES

a. *Plans and organizes aircraft maintenance activities.* Plans and organizes aircraft/avionics maintenance facilities, and provides required space, test equipment, tools, and spare parts. Organizes units for accomplishment of functions such as organizational, field, avionic, and DCM staff activities. Determines personnel requirements qased on present and projected workloads. Develops and improves procedures and techniques for maintenance, repair, calibration, and modification of avionics, air launch missile electronic, and aircraft gun systems, including bomb-navigation, offensive and defensive fire control, and weapon control systems; electronic flight control, auto pilot, and compass systems; airborne communications, navigation, radar, photographic, and electronic countermeasures equipment; and related test, support, and training equipment. Establishes performance standards for units including quality and time standards for functions such as repair of wings and fuselage, engine change and overhaul, modification of components, repair of precision measurement equipment, and to include inspection; malfunction analysis and isolation; usage of test equipment; alignment, calibration, removal, repair, and/or replacement of components and parts; and boresighting aircraft gun systems. Institutes controls to maintain quality and quantity of work performed.

b. *Directs aircraft maintenance activities.* Assigns work to technicians and establishes priorities and production control to insure effective distribution of workload and maximum utilization of personnel and facilities within units. Observes work in progress and inspects completed repairs to insure adequacy of maintenance and compliance with directives and policies. Interprets technical orders and directives and resolves problems related to operational efficiency, training, shop equipment, and facilities. Supervises preparation and maintenance of records and reports incident to systems inspection and equipment operation and maintenance. Maintains liaison with research and development activities, military activities, and representatives of private and public agencies to keep abreast of managerial and technological improvements, and to coordinate joint use of facilities. Establishes and monitors on-the-job training and selects individuals for attendance at formal and special courses to insure qualifications of assigned personnel.

c. *Coordinates aircraft maintenance activities.* Advises commanders and staff activities of capability of aircraft maintenance facilities and avionics systems to meet operational requirements. Coordinates with maintenance shops on armament, electronic, and other installed equipment. Consults with personnel staff on utilization of personnel. Maintains liaison with supply staff to insure availability of supplies to support present and projected workloads. Maintains liaison with factory technical representatives in solving problems related to installation or modification of new and complex equipment. Coordinates with munitions activities to effect delivery and loading of appropriate munitions. Confers with operating activities to ascertain operational problems and quality of maintenance support. Advises operating and staff activities on operational status of assigned aircraft.

d. *Supervises technical aircraft maintenance functions.* Develops procedures and techniques of initial installation, retrofit, and major modifications of equipment. Evaluates effectiveness of systems operation and recommends changes in operational usage and modification of equipment. Serves as technical inspector to determine nature and extent of repairs and recommends reclamation or salvage. Serves as technical advisor on aircraft accident investigation boards. Inspects operating activities to determine compliance with technical directives and maintenance management policy, and to provide assistance. Inspects and examines aircraft/avionic systems components to isolate defects and determine need for submitting unsatisfactory reports. Prepares staff studies and reports on maintenance matters including changes in maintenance design requirements, engine performance, and avionic maintenance matters. Assures proper administration of man-hour accounting and maintenance information systems.

3. SPECIALTY QUALIFICATIONS

a. *Knowledge.* Knowledge of maintenance management procedures; capabilities, limitations, and techniques of employment of avionics systems; theory of flight; principles of airframe construction, engines, and aircraft installed systems; and supply, transportation, and POL operation procedures as related to aircraft/avionic/airborne missile maintenance units is mandatory.

b. *Education.* Bachelor's degree, preferably in management or engineering, is desirable.

c. *Experience.* A minimum of 18 months' experience in aircraft/avionic maintenance assignments is mandatory. It is mandatory that experience include organization and direction of activities performing functions of installation, assembly, testing, repair, alignment, calibration, or modification of aircraft, engine, and avionic systems/equipment under shop and field conditions; and related training, support, and test equipment.

d. *Training.* Completion of an aircraft maintenance course is mandatory.

4. SPECIALTY DATA

a. *Grade Spread.* Warrant officer and second lieutenant through major.

b. *Related D.O.T. Jobs:*

Manager, Industrial Organization 189.118
Industrial Engineer 012.188

c. *Related DOD Occupational Group:* 4D

AFSC 4096
Entry AFSC 4091

OFFICER AIR FORCE SPECIALTY

AEROSPACE MAINTENANCE DIRECTOR

1. SPECIALTY SUMMARY

Directs and monitors aerospace maintenance and related materiel programs, including planning and budgeting for design, modification, and repair of aerospace vehicles, munitions, and related facilities and support equipment; commands large consolidated maintenance units; serves as wing/base Deputy Commander for Maintenance (DCM)/Chief of Maintenance; and serves as senior maintenance advisor to commanders and senior Air Staff chiefs.

2. DUTIES AND RESPONSIBILITIES

a. *Plans, organizes, and directs aerospace maintenance programs.* Reviews aircraft maintenance and related materiel support requirements in terms of specific objectives, relative priorities, capabilities, and limitations. Directs preparation of plans for maintenance support of operational missions. Plans and establishes maintenance policies and procedures; and exercises staff supervision over maintenance and related support activities to assure effective and complete maintenance support of Air Force mission requirements. Develops policies and directives pertaining to the design, modification, and repair of aerospace vehicles, munitions, maintenance facilities, and related support equipment. Directs preparation of budget estimates and financial plans in support of maintenance requirements. Directs studies of maintenance organization and manning requirements. Directs activities of wing/base aerospace maintenance units and headquaters maintenance staff elements.

b. *Monitors aerospace maintenance activities.* Inspects operating activities to determine the condition of required facilities, and effectiveness of maintenance programs in support of operational requirements, and to insure coordination between operations, maintenance, and related support units. Evaluates maintenance programs, estimates trends, and projects requirements and capabilities of maintenance activities. Monitors preparation of publications related to maintenance methods, policies, and procedures. Supervises related materiel units.

c. *Coordinates aerospace maintenance programs.* Advises commanders and staff on status of maintenance programs and the capability to meet current and projected operational requirements. Coordinates with comptroller activities in projecting budget requirements. Maintains liaison with civilian and military research and development agencies. Convers with related materiel support agencies such as supply, transportation, and POL.

3. SPECIALTY QUALIFICATIONS

a. *Knowledge.* Knowledge of Air Force maintenance management policies and procedures; and operational policies and procedures of all materiel functions as they relate to aerospace maintenance is mandatory.

b. *Education.* Master's degree, preferably in engineering or management, is desirable.

c. *Experience.* Full qualification as a Maintenance Staff Officer is mandatory. In addition, a minimum of 12 months' experience in aerospace maintenance director assignments is mandatory. It is mandatory that experience include directing and monitoring aerospace maintenance and related materiel programs.

d. *Training:*

(1) Completion of an entry level integrated maintenance officer course is mandatory.

(2) Completion of an appropriate course at the Air University Institute for Professional Development is desirable.

(3) Completion of a senior professional military education course is desirable.

4. SPECIALTY DATA

a. *Grade Spread.* Lieutenant colonel and colonel.

b. *Related D.O.T. Jobs:*

Manager, Industrial organization 189.118
Industrial Engineer 012.188

c. *Related DOD Occupational Group:* 8A

APPENDIX N

EXCERPTS FROM AFR 36-23

Chapter 23

AIRCRAFT MAINTENANCE AND MUNITIONS--CAREER PROGRESSION GUIDE

23-1. Purpose. This chapter gives information on career progression for Aircraft Maintenance and Munitions Officers.

a. Career Field Description. Generally, the aircraft and munitions maintenance specialty is composed of those functions responsible for managing maintenance activities of assigned unit aircraft. This includes aircraft subsystems and munitions, as well as operating numerous facilities associated with assigned weapon systems support. This specialty also includes managing depot level maintenance and munitions activities. The personnel and materiel resources used in aircraft maintenance or munitions activities demand a high degree of professional competence in career maintenance managers with extensive and varied logistics support backgrounds. The aircraft maintenance and munitions career fields have been designed to create numerous opportunities for future senior maintenance managers to serve in different responsible positions in order to fully develop broad maintenance managerial skills. Duty will range in various maintenance units, for example, avionics, field, munitions, and organizational maintenance squadrons to Production Oriented Maintenance Squadrons (POMO), at varying levels of command (for example, the tactical Air Forces, SAC, MAC, AFSC, and AFLC, unit, NAF, MAJCOM). Thus maintenance officers will develop a solid working knowledge of the multifaceted Air Force maintenance mission.

b. Specialty Description. The aircraft maintenance and munitions career field is divided into two basic specialties at the company grade level: aircraft maintenance (AFSC 4024) and munitions maintenance (4054). Company grade officers are expected to receive diverse work experience in their respective specialties. At the field grade level, both specialties merge into AFSC 4016, Aircraft Maintenance Staff Officer. Officers in this specialty may perform duties across the entire spectrum of aircraft maintenance or munitions organizations to increase their potential for senior positions as Aerospace Maintenance Director (AFSC 4096). While there is no one best method of career progression, the key to development is how well an officer performs in a variety of aircraft maintenance and munitions positions throughout a career. As soon as an officer has demonstrated proficiency in one aspect of the primary specialty, he or she should be given the opportunity to move through other phases of his or her career field. For example, after 1 or 2 years as an Organizational Maintenance Squadron (OMS) or Aircraft Generation Squadron (AGS) Flightline Officer, a maintenance officer could progress to Job Control or to one of the other maintenance squadrons. A munitions officer could progress from OIC of the Loading Section to Munitions Storage Branch Chief. After several years in the primary specialty (AFSC 4024 or 4054), career officers may be identified to move into the other specialties in the 40XX field. This lateral movement is encouraged through permanent change of assignment (PCA) without permanent change of station (PCS) or through PCS.

(1) AFSC 4024--Aircraft Maintenance Officer (Lieutenant through Major). This specialty includes managing activities that are involved in removing, installing, modifying, overhauling, and storing aircraft subsystems (airframes, engines, avionics, mechanical, hydraulic, electrical, fuel subsystems, and so forth) and maintaining equipment required to repair aircraft. Furthermore, aircraft maintenance managers are responsible for operating and maintaining special facilities such as aircrew training devices (simulators), precision measurement equipment laboratories (PMEL), engine fuel cells, spectrometric oil analysis laboratories, and so forth. In POMO organizations, officers assigned to the AGS may supervise weapons loading activities, including overall supervison of load crews. Aircraft maintenance officers serve in supervisory positions and act as technical consultants to the unit Deputy Commander for Maintenance in support of the overall wing mission. A significant portion of the aircraft maintenance officer's responsibility is to constantly evaluate technician training requirements, the adequacy of prescribed technical data for systems repair, and the availability or serviceability of assigned test equipment and repair devices.

(2) AFSC 4054--Aerospace Munitions Officer (Lieutenant through Major). This AFSC includes supervisory and technical responsibilities for installing, maintaining, modifying, and repairing air launch missile propulsion systems and aerospace munitions release, launch, suspension, and monitor systems. Also included are the supervisory and technical responsibilities for assembly, storage, handling, surveillance, checkout, loading, maintenance, and modification. This includes modifying nuclear, explosive, chemical, and incendiary aerospace munitions including bombs, clusters, warheads, mines, guided bombs or munitions, guided aircraft missiles and rockets, reentry vehicles, ammunition, and disposal of munitions items that are not serviceable; advising on installation defense and tactical employment of aerospace munitions; performing chemical technical escort duties; and, as selected volunteers, performing explosive ordnance disposal duties when hazardous explosive ordnance of any type is involved. Also included are the management and technical responsibilities for Missile/Explosive/Nuclear (MEN) safety programs.

(a) "A" Suffix--Munitions. This suffix represents most of the munitions officer requirements. These officers manage aerospace munitions activities.

(b) "B" Suffix--Explosive Ordnance Disposal (EOD). Only selected volunteers are trained and assigned to these hazardous duties, for example, rendering dangerous ordnance safe.

(c) "X" Prefix--Aerospace Missile/Explosive/Nuclear (MEN) Safety. To qualify for the "X", an officer should possess AFSC 4054A or AFSC 4054B and should have completed the appropriate MEN formal training courses. An officer in this AFSC:

1. Develops, plans, administers, and conducts the MEN safety programs and promotes safety consciousness among military and civilian personnel.

2. Conducts MEN safety inspections.

3. Helps in MEN accident and incident investigations and reporting.

4. Supervises and conducts MEN safety education and training programs.

(3) AFSC 4016--Aircraft Maintenance Staff Officer (Major through Colonel). Officers in this specialty perform the managerial tasks of planning, organizing, coordinating, directing, and controlling aircraft maintenance and repair operations and programs. They may command maintenance units, serve as staff advisors to commanders, or technical advisors to superior staff officers. They may direct, manage, and administer munitions activities, including the maintenance of aerospace munitions release systems, storage, assembly, maintenance, loading or mating, demilitarization or destruction, and EOD; and command aerospace munitions activities.

(4) AFSC 4096--Aerospace Maintenance Director (Lieutenant Colonel or Colonel). This specialty represents the highest echelons of maintenance, the executive level of managing Air Force maintenance or munitions activities. Officers who serve in this AFSC have the direct and primary responsibility for aerospace maintenance, munitions, and related logistic programs. An officer may perform duties as Deputy Commander for Maintenance at wing level or Director or Division Chief at NAF, MAJCOM or HAF level.

23-2. Education and Training:

a. Initial Training. Each officer who enters the career field must complete a resident basic maintenance officer course. Nonrated officers must complete either the Aircraft Maintenance Officer Course (C30BR4021-002) or the Aerospace Munitions Officer Course (G30BR4054A) depending on the entry AFSC. Rated supplement officers newly assigned to aircraft maintenance or munitions activities must attend the Accelerated Maintenance Officer Course (30BR4021-001), unless they have attended the basic maintenance officer course.

b. Crossflow Training. Maintenance officers are encouraged to broaden their experience in their functional area. In that regard, two courses are available to provide necessary training to dually qualify maintenance officers for increased future responsibilities. Munitions for Aircraft Maintenance Officers (G30LR4054A-002) and Aircraft Maintenance for Munitions Officers (C30LR4021-003) were established for this purpose.

c. Staff School. The Aerospace Maintenance Staff Officer Course (G30AR4011) is available for senior captains and field grade officers in preparation for future staff duties. The course includes an introduction to staff management techniques, aircraft, avionics, and munitions technical systems, and functional responsibilities at the Air Staff, MAJCOM, NAF, and unit levels.

d. The Air Force Institute of Technology (AFIT) School of Systems and Logistics, conducts a large number of short courses that are designed to provide instruction in logistics and maintenance management. Several specific courses are offered for the continuing education of maintenance officer:

(1) LOG 261--Maintenance Management.

(2) LOG 262--Information Maintenance Management Concepts.

(3) Defense International Logistics Management Course for Maintenance Officers Identified with Foreign Military Activities.

e. Graduate Education. Maintenance officers are encouraged to continue their education beyond the baccalaureate. Various on-base programs are available through off-duty education. Maintenance officers are also encouraged to apply to AFIT to determine their eligibility for the various graduate logistics degree programs.

f. Professional Military Education (PME). Maintenance officers should enroll in each level of PME as soon as they become eligible, either through correspondence or base seminar programs. These PME courses increase their opportunity for promotion, greater responsibility and better job selection, and improve their chances for attending residence PME schools.

g. Education With Industry (EWI). This program is designed to give career maintenance officers the education and experience needed for future dealings with industry and to prepare them for top leadership positions in maintenance and logistics. Maintenance officers are encouraged to volunteer for this program.

23-3. Career Broadening. Maintenance officers are encouraged to broaden their experience in the maintenance functional category, such as crossflowing aircraft maintenance officers into munitions activities and vice versa. Career broadening is often misinterpreted as retraining or complete withdrawal from maintenance. The purpose of career broadening is to give selected career maintenance officers the opportunity to increase their potential through utilization in other career fields, and subsequently return them to maintenance duties. The time for career broadening varies with each officer; however, he or she should have very strong maintenance credentials coupled with a reputation of dedication and hard work. A key consideration is the officer's oversea history. Maintenance officers vulnerable for remote or accompanied oversea tours are not good candidates for career broadening, unless they can be utilized in an oversea location. On the other hand, maintenance officers returning from oversea tours are, in most cases, strong candidates for career broadening assignments.

a. Categories of Career Broadening. Some officers may be assigned duties in AFSC 40XX that are in fact career broadening assignments in their own right. These positions may be in nonmaintenance directorates or

activities that are not maintenance sortie production duties, for example, Logistics Readiness Center or maintenance instructor duty. Other career broadening would assign aircraft maintenance officers (AFSC 4024) to munitions (AFSC 4054) duties. Career broadening may also include training and duties in other career fields. Maintenance officers are especially encouraged to broaden into other logistics career fields, for example, *Supply* (AFSC 64XX), *Transportation* (AFSC 60XX), Procurement (AFSC 65XX), and Logistics Plans (AFSC 66XX). Moreover, maintenance officer with engineering backgrounds are encouraged to career broaden into engineering duties (AFSC 28XX), with financial backgrounds into AFSC 67XX, or various instructional duties, for example, OTS and ROTC. It is important to remember that career broadening is intended to give the maintenance officer an opportunity to learn and experience new management and supervisory roles for a definite period, then return to his or her primary career field, thus increasing his or her overall potential.

b. Rated Supplement Officers. Because of their aeronautical backgrounds, rated officers with recent aircrew duty are ideal candidates to transit into maintenance. The pilot or navigator brings an intimate knowledge of flight problems that enhances his or her understanding of *maintenance and aircraft or munitions systems* capabilities and limitations. To become qualified in maintenance, an officer must complete the Accelerated Maintenance Officer Course (C30BR4021-001), unless he or she has attended a basic maintenance or munitions officer course (C30BR4021-002/G30BR4051). As a rule, this will precede assignments to operating level positions; however, officers who complete certain AFIT advanced degree programs may be assigned directly to these positions, with formal technical training scheduled later. Lateral transferees should be officers who have demonstrated above-average ability in their primary Air Force specialties; possess an exceptional degree of managerial talent; and have *demonstrated leadership potential*. Assignment of rated officers into maintenance duties must be carefully managed so as not to impede either the development of that officer or his or her career maintenance officer contemporaries. The entry of rated officers into the rated supplement and 40XX duties must be managed within the guidelines and goals of the AFMPC/MPCROR7 Rated Supplement management plan.

23-4. Specified Career Positions:

a. Designed Career Positions. Some positions are considered to be so important to the effectiveness of maintenance functions that they require highly trained and experienced career maintenance officers. These positions were designated to make full use of professional maintenance officers and should not be filled by officers on career broadening assignments from other specialties. It is preferable to have a qualified career maintenance officer of lesser rank to fill a designated career position than an officer with the authorized rank, who is on a broadening assignment. These positions are.

Position*	Level Equivalent
Chief of Maintenance Deputy Commander for Maintenance	All levels
Maintenance Control Officer	All levels
Commander	Squadron
Director or Deputy Director of Maintenance (Engineering/ Munitions	Air Division Numbered AF MAJCOM HQ USAF Joint Command
Chief, Maintenance, Munitions Staff, Division, Branch	Air Division Numbered AF MAJCOM HQ USAF Joint Command

*In addition, a sufficient number of headquarters staff positions will be designed as career positions to provide a professional base of career specialties. A minimum of 80 percent of headquarters authorizations should be so identified.

b. Assignment Considerations. Proven ability in past maintenance duties is the most important factor in assigning an officer to a designated career position. *Priority for assignment to more responsible positions*, technical schools, AFIT, EWI, ASTRA, and professional military schools will be given to officers who have demonstrated outstanding duty performance and growth potential. Secondary consideration for qualification should include the following:

(1) Appropriate school attendance should precede the assignment when a special requirement designating a specialized background exists.

(2) Field grade officers with less than 2 years of experience as a 4016 should complete the Aerospace Maintenance Staff Officer Course (30AR4011) just before or shortly after assignment.

(3) An appropriate graduate education or the completion of the appropriate professional military school is highly desirable.

23-5. Career Progression. This guide shows five phases of progression through a 20- to 30-year career. Each phase is related to years of active commissioned service, military grade, job assignments, technical and professional military schools, and educational levels. This guide should be considered as flexible, in that it is influenced by Air Force needs and the officer's potential and ambitions.

a. Initial Phase (0 through 4 Years)

(1) Assignments. Duties during this phase should be rotated among the various functions performed at squadron and wing levels. Performance and experience opportunities for the beginning maintenance officer should be closely monitored by supervisors and commanders. At this level, complete understanding and knowledge of the Air Force Maintenance Management System should be acquired. Some maintenance officers will volunteer for remote assignments; accordingly, these assignments will most likely occur in their fourth commissioned year. Other oversea tours will be available; however, Specified Period of Time Contracts (SPTC)

must be initiated for those volunteers who have dates of separation. Most maintenance officers will spend this phase of their career on one base, therefore, they should gain a wide range of experience in as many maintenance activities as possible. Fully qualified munitions officers should consider EOD or weapons safety duties. These positions offer greater assignment options and responsibilities.

(2) Education and Training:

(a) A baccalaureate degree in an engineering discipline or management is desirable.

(b) The completion of the Aircraft Maintenance Officer Course (C30BR4021-002) or Aerospace Munitions Officer Course (G30BR40541A) is mandatory.

(c) Eighteen months of duty in AFSC 4051 or 4021 is required for the award of the fully qualified maintenance officer AFSC.

(d) Maintenance officers should finish Squadron Officer School (SOS) either by correspondence or in residence. In addition, they should begin post graduate work, providing they have solid credentials as supervisors and managers, before undertaking a rigorous post graduate degree program.

b. Intermediate Development Phase (5 through 8 Years):

(1) Assignments. Officers will continue working in the base structure, most likely at squadron level. They will be placed in positions of increasing responsibility, such as officers in charge of shops and sections, to improve their firstline supervisory and technical capabilities. Participation on base committees, panels, boards, and so forth should be encouraged. Officers with exceptional analytical and production-coordinating talents should be channeled to production control duties. Other exceptionally capable officers should be encouraged to seek broadening assignments as ATC maintenance instructors, Field Training Detachment (FTD) commanders, or to duties outside the maintenance field - for example, logistics specialties. Highly motivated aircraft maintenance officers may crossflow into munitions activities and vice versa. Many maintenance officers will find themselves serving in oversea units for the first time, most likely in new weapons systems with new responsibilities. This is perhaps the most important phase in a maintenance officer's career, for it will determine if a successful transition from a maintenance apprenticeship to the professional, experienced maintenance officer has occurred. It will serve as the guide for determining the officer's potential for field grade duties and responsibilities.

(2) Education and Training.

(a) SOS must be completed either in residence or by correspondence. Serious work on a post graduate degree should start. Interested and qualified officers should act to compete for one of the AFIT graduate programs.

(b) Maintenance officers selected for a NAF or MAJCOM staff assignment should attend the Aerospace Maintenance Staff Officer Course (G30AR4011).

(c) Maintenance officers crossflowing into other maintenance disciplines should attend Aircraft Maintenance for Munitions Officers (C30LR4021-003) or Munitions for Aircraft Maintenance Officers (G30LR4051A-002).

c. Advanced Development Phase (9 through 15 Years):

(1) Assignments. Experience should be diversified during this phase by rotating into different echelons of command, MAJCOMs, and geographical areas. Officers in this phase can expect a staff assignment at wing, group, NAF, and MAJCOM levels. A few maintenance officers who have outstanding maintenance backgrounds will occupy positions in AFSC, AFLC, AFISC and DNA. Officers with exceptional instructing capabilities should consider applying for OTS, AFROTC, or ATC instructor duty. Graduates of AFIT programs should be assigned duties that use their training to the maximum.

(a) Officers who enter maintenance during this phase should be assigned at squadron or wing operating levels. Selected maintenance officers should be assigned to other utilization fields for career broadening during this period. Such assignments should not be more than 4 years. This phase is particularly important for the individual's potential as a field grade officer will be determined. Consequently, jobs of increased responsibility will be the primary motive for reassignments. By this stage in their career, maintenance officers should have a complete oversea profile (for example, one accompanied tour and one remote tour) in order to optimize their background and experiences to meet increased job demands.

(b) A few maintenance officers will intern as maintenance supervisors and progress to squadron commander; others will be groomed for future commander positions and maintenance control officer responsibilities; and some will join higher headquarters staffs as inspectors, staff or action officers, and planners. Essentially, this stage in a maintenance officer's career is a period to test his or her abilities to speak, write, plan and excel in stressful situations, drawing heavily on initiative, experience, and training.

(2) Education and Training:

(a) Intermediate Service School (ISS) must be completed in this stage, as early as possible, either by correspondence, seminar, or in residence. Clearly, officers who have completed various ISS programs on their own initiative often are designated for resident programs and are usually stronger candidates for key jobs.

(b) It is highly desirable that officers attend the Aerospace Maintenance Staff Officer Course, particularly maintenance officers joining NAF, MAJCOM or HAF staffs.

(c) Maintenance officers should be well towards completing a post graduate degree, preferable in a program that complements their supervisory and management experiences. Some eligible and qualified maintenance officers will be selected to attend resident AFIT advanced degree programs.

(d) The various Education with Industry programs are well suited for career maintenance officers in this phase of their careers.

d. Staff and Command Phase (16 through 22 Years)

(1) Assignments. During this phase, highly qualified officers will be assigned as director of maintenance; director of munitions; chief of maintenance; maintenance squadron commander; deputy commander for maintenance; maintenance supervisor; and staff level positions at NAF, MAJCOM, and HQ USAF. In particular, the most highly qualified officers should command maintenance squadrons. Broadly experienced, outstanding officers will be considered for HQ USAF and joint staff duty. Normal staff duty assignments will be at MAJCOM or NAF headquarters. It is during this phase that a maintenance officer has the greatest opportunity to tackle the toughest jobs. Career maintenance officers will be challenged to perform in varied assignments during this phase. Wing commanders have a clear responsibility to select maintenance squadron commanders on the basis of proven skills and performance. Consequently, they may require a period of internship and observation for even the strongest squadron commander candidate.

(2) Education and Training. Officers should attend the Aerospace Maintenance Staff Officer Course, if they have not completed it previously. Designated officers may attend AWC, NWC, or the ICAF. Officers who do not attend a senior service school in residence are encouraged to pursue senior level professional courses, through correspondence or by taking part in local seminar programs. Short courses in specialized subjects are appropriate. Qualified officers may work toward doctorates in technical or management disciplines.

(3) Director Positions. Officers who aspire to become a Director of Maintenance and Munitions (AFSC 4096) or Director of Logistics (0046) should attain a fully qualified AFSC in another logistics specialty. That work should be completed during this phase.

e. Executive or Director Phase (23 Years Plus). Officers in this phase will occupy key managerial positions at virtually all echelons, including command of maintenance or logistics organizations. All major schooling should be completed by this phase.

23-6. Jobs for Maintenance Officers:

a. With the growth in the tactical Air Force (TAF), maintenance officers should include at least one tour in the tactical environment in their career plan. Some oversea positions require previous tactical experience. Consequently, maintenance officers without this experience may be assigned to CONUS tactical units to prepare for eventual oversea assignments. Maintenance officers are encouraged to seek diversity by lateral movement within their maintenance complex. Various crossflow training programs were set up to improve maintenance officer career development at the least cost and turbulence. The munitions career area probably offers the aircraft maintenance officer a solid career opportunity; also one of the greatest challenges. The converse is also true. Munitions officers may find excellent career opportunities by crossing over into the traditional aircraft flightline or shop environment.

b. Jobs for maintenance officers are located Air Force-wide in about every corner of the world. A good rule is this: If there is an aircraft operational mission, whether a US Air Force tactical or strategic wing, or in an allied nation that uses American-made aircraft, you will find a requirement for aircraft maintenance and munitions officers. Many other activities have requirements for maintenance officers: Air Logistics Centers, System Project Officers, Technical Training Centers, NATO Weapons Storage Sites, Defense Nuclear Agency, Allied Forces Exchange locations, etc. The maintenance officer is in constant demand by logistics functions AF-wide to provide much needed experience in maintenance engineering.

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BIOGRAPHICAL SKETCHES

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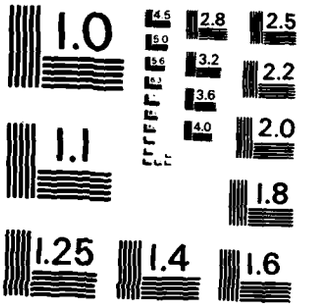

First Lieutenant Timothy D. Bair hails from Williamsport, Pennsylvania. He graduated from Pennsylvania State University in 1978 with a Bachelor of Science degree in biology, and earned his commission in the United States Air Force through the Reserve Officer Training Corps program. He was assigned to the 48th Fighter Interceptor Squadron at Langley AFB, Virginia, where he held positions as Aircraft Generation Branch Assistant OIC and Component Repair Branch OIC. Upon graduation from AFIT, he will be assigned to the 9th Air Force Directorate of Maintenance Management at Shaw AFB, South Carolina.

Captain Clinton F. Gatewood is from Oakland, California. After enlisting in the United States Air Force in 1963, he served as an avionics technician in several commands. He graduated cum laude from Eastern New Mexico University in 1974 with a Bachelor of Business Administration degree in management, and earned his commission through the Officer Training School at Lackland AFB, Texas. His previous assignments include the 375th Aeromedical Airlift Wing and the 33rd Aerospace Rescue and Recovery Squadron. His previous duties include Flightline OIC, Programs and Mobility Officer, Maintenance Control Officer, and Chief of Maintenance. Upon graduation, Captain Gatewood will remain at AFIT to assume co-director duties for the maintenance courses in the Professional Continuing Education program.


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